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ASTOR, LENOX AND
TILDEN FOUNDATIONS

REPORT

OF THE

DEPARTMENT OF HEALTH

OF THE

PANAMA CANAL

FOR THE

YEAR 1914

CHAS. F. MASON

Lieut. Colonel, Medical Corps, United States Army
Chief Health Officer, Balboa Heights, Canal Zone

WASHINGTON
1915

[redacted]

Panama Canal. Health Department

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LETTER OF TRANSMITTAL.

DEPARTMENT OF HEALTH,
Balboa Heights, Canal Zone, February 23, 1915.

Col. GEO. W. GOETHALS,
Governor of the Panama Canal,
Balboa Heights, Canal Zone.

SIR: I have the honor to submit the following report of the operations of the department of health for the calendar year 1914.

Very respectfully,

CHAS. F. MASON,
Chief Health Officer.

GENERAL REMARKS.

One case of smallpox was removed from the Pacific Mail Steamship *Newport* on April 16, and recovered. With this exception, no cases of yellow fever, smallpox, or plague originated on or were brought to the Isthmus during the year.

The department was completely reorganized on April 1, as set forth in detail in my annual report for the fiscal year. There has been a steady reduction in force and expenses throughout the year. The cost of the department for the year was $1,094,682.92, as compared with $1,484,941.09 for 1913. The average number of employees on the rolls during the year was 44,329, as compared with 56,654 for 1913.

There has been a large shifting of population from all along the line toward the Pacific end of the canal. Two new towns, La Boca and Balboa, have come into being, the former with a population of about 4,000, and the latter about 1,200.

A census of the Canal Zone has been taken three times during the year, the last showing a net decrease of more than 14,000 persons since January, 1913. More than half of our employees are now living in Panama. The census of Panama and Colon, taken in August and September, 1914, showed an increase in the population of these cities of 12,828 in Panama and 9,099 in Colon.

During the year a general vaccination was done in all the schools of the Canal Zone, as well as those of Panama and Colon; 117 children were vaccinated in the Canal Zone, 5,186 in Panama, and 1,097 in Colon. The percentage of "takes" in the Canal Zone was 67; in Panama, 80; and in Colon, 80. In addition to the vaccinations in the schools, 33,204 other vaccinations were done, with a percentage of 68 "takes."

A plan for a thorough annual physical examination of all gold employees has been approved and the work was started in December.

VITAL STATISTICS.

EMPLOYEES.

The health of employees has been better than in any previous year.

The total admission rate to hospitals for 1914 was 244.49, compared with 351.10 for 1913, and for disease alone 182.57, as compared with 246.91 for 1913.

The total death rate for 1914 was 7.04, as against 8.35 for 1913; and the death rate for disease 4.40, as compared with 5.24 for 1913. The noneffective rate for 1914 was 12.22, compared with 15.97 for 1913.

The changes in the regulations governing sick leave and admission to hospitals, which became effective soon after the reorganization, no doubt had some influence in reducing the admission and noneffective rates, but the fact that the death rate has also fallen decidedly shows that other factors are more important.

With regard to malaria, the death rate has been reduced more than 50 per cent since 1913 (0.16 in 1914, 0.37 in 1913), and the admission rate to hospitals more than 15 per cent (65 in 1914, 76 in 1913). The constantly noneffective rate, hospitals and quarters, which was only computed in the last five months of 1914, was 1.51.

There were no deaths from hemoglobinuric fever throughout the year; there were six such deaths in 1913.

In the latter half of the year a strong effort was made to compel employees suffering from malaria to continue the use of quinine after discharge from hospital for at least a month; failure to do so was punished by suspension or discharge. It is believed that this measure had had good effect.

Of the seven deaths from malaria four did not occur in hospital; one died without medical attendance, and in three others the diagnosis was clinical only, and therefore questionable.

The admission rate for typhoid fever 0.52 was more than 22 per cent less than for 1913, though the case mortality was higher, giving a death rate of 0.09 as against 0.07 for 1913.

In the latter half of the year a periodic physical examination, including urine and feces, has been made of all food handlers in the kitchens, mess rooms, and commissaries of the Panama Canal, with the result that one typhoid carrier and a number of cases of contagious diseases were detected and eliminated.

The admission rate for dysentery was 1.80 compared with 1.97 for 1913, but the death rate was slightly higher.

The death rate from pneumonia has increased from 0.83 in 1913 to 0.95 in 1914; all the deaths but one were among the black employees. The increase in the disease is probably due to unusual prevelance of measles and the overcrowded conditions in which the people live in Panama.

The five diseases causing the highest number of hospital admissions, with their rates, were as follows:

	Admissions.	Rate.
Malaria	2,884	65.06
Venereal diseases	1,001	22.58
Acute bronchitis	197	4.44
Mumps	122	2.75
Pneumonia	120	2.71

The five diseases causing the highest number of deaths, with their rates, were as follows:

	Deaths.	Rate.
Pneumonia	42	0.95
Tuberculosis	40	.90
Nephritis	22	.50
Heart, organic disease of	16	.36
Malaria	7	.16

Effects of Season.

The highest death rates for disease occurred in the months of March and May, and the lowest in November and August. The cause of the increased rates was an increase in the deaths from pneumonia and tuberculosis. The highest admission rates for disease were in January and March, and the lowest in November and May.

Effects of Race.

The admission rate to hospitals and death rate for disease for black employees were 191.93 and 4.63 per thousand, as compared with 523.63 and 3.13 from disease for white employees. The noneffective rate for disease and injuries for black employees per thousand was 10.16, as compared with 23.20 for white employees.

The admission rate to hospitals for malaria was 56.96 for blacks as compared with 108.06 for white employees.

The total death rate for Americans was 5.72, compared with 9.53 for Europeans; for disease, 2.67 for the former and 4.48 for the latter.

There were no deaths among Americans from malaria, dysentery, or typhoid fever during the year. The death rates among Europeans and blacks for these diseases were as follows:

	Europeans.		Blacks.	
	Deaths.	Rate.	Deaths.	Rate.
Malaria	2	1.12	5	0.13
Dysentery			4	.11
Typhoid fever			4	.11

VITAL STATISTICS.

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The total death rate for Americans was 5.72, compared with 9.53 for Europeans; for disease, 2.67 for the former and 4.48 for the latter.

There were no deaths among Americans from malaria, dysentery, or typhoid fever during the year. The death rates among Europeans and blacks for these diseases were as follows:

	Europeans.		Blacks.	
	Deaths.	Rate.	Deaths.	Rate.
Malaria	2	1.12	5	0.13
Dysentery			4	.11
Typhoid fever			4	.11

Deportations.

The number of deportations was 176, divided as follows: Employees, 115; nonemployees, 61; disease, 140; and injury, 36.

Canal Zone.

With an average population of 46,379 in the Canal Zone there were a total of 710 deaths during the year; of these 614 deaths were from disease, giving a rate of 13.24 per thousand, as compared with 14.43 for the year 1913. The death rate from tuberculosis was 1.5; the percentage of all deaths was 10. But for the enormous infantile death rate among the negroes due to ignorance and indifference on the part of mothers, the showing would be still more favorable.

The birth rate based on the last five months of the year was 19. The infant mortality based on the same period was for white children under 1 year of age 29 per 1,000, and for colored children 347, with a general average of 252. Of the total deaths from disease, based on the last eight months of the year, the percentage under 5 years of age was 42.

Panama City.

The average population of the city for the year was 53,948, among whom there were a total of 1,863 deaths; of these, 1,772 deaths were from disease, giving a rate of 32.85 per 1,000, as compared with 30.21 for the preceding year. The death rates for malaria and dysentery were 1.91 and 0.69, respectively.

The birth rate based on the last five months of the year was 54.52. The infant mortality for the same period was 272.

Of the total deaths from disease based on the last eight months of the year the percentage under 5 years of age was 50.

The high death rate in Panama is due to several causes. It will be noted that 50 per cent of the deaths occurred in children under 5 years of age; they were due principally to gastrointestinal diseases, the result of ignorance and indifference on the part of mothers. Another factor of importance is the serious overcrowding in the tenement districts, the result of the rapid increase in the population of the city without a corresponding growth in housing facilities. In the recent census enumeration it was a frequent occurrence to find six or more persons sleeping in one unventilated room 10 by 10 feet. Tuberculosis gave a death rate of 4.26 and 12 per cent of the total deaths.

There was a small outbreak of beriberi commencing on July 21, with 1 case; 2 more cases were reported in August, and 16 in September; in October there were 2; November 4, and December 2; about half of the cases were from Chiriqui prison, the remainder were scattered, and a number were brought in from outside localities.

Out of 27 cases of typhoid fever which occurred in Panama, 20 were in the months of February to August, inclusive; nearly three-fourths of all the cases in the zone and Colon occurred in these same months, and were traceable to sewage-polluted oysters obtained in Panama.

COLON.

The average number of inhabitants for the year was 23,265, among whom there were 590 deaths; of these, 563 were from disease, giving a rate of 24.20 per 1,000 as compared with 22.74 for the year 1913. The death rates for malaria and dysentery were 0.86 and 0.17, respectively. The death rate for tuberculosis was 3.69, 14 per cent of the entire deaths from all causes.

The birth rate based on the last five months of the year was 48.60. The infant mortality for the same period was 194.

Of the total deaths from disease based on the last eight months of the year, the percentage under 5 years of age was 43.

DIVISION OF HOSPITALS.

There have been considerable reductions in the personnel of this division and the cost of same during the year. The number of employees on January 1, 1914, was 570, and on December 31, 1914, 392. The cost of the division was $883,356.49 in 1913, and for 1914, $596,858.24.

There were 919 charity patients admitted with a total of 49,939 days, as compared with 1,340 patients and 67,216 days in 1913. At a minimum average cost of $1 per day this represents an expenditure of about $50,000, of which $2,400 is returned by the department of civil administration.

The number of soldiers admitted to hospital increased from 405, with 5,938 days, in 1913, to 1,481, with 17,704 days, in 1914.

ANCON HOSPITAL.

The average number of patients constantly present in Ancon Hospital during the year was 929, as compared with 1,159 for 1913; the average number of employees constantly sick was 452 for 1914 and 674 for 1913.

The gross cost of the hospital for the year was $461,056.64, as compared with $529,282.74 for 1913.

Complete plans and estimates have been prepared for the reconstruction of Ancon Hospital on a permanent basis, but the necessary funds have not yet been appropriated. Two of the wards have been condemned and abandoned as unsafe. All the buildings to the west of the nurses' quarters have been removed to make the ground available for other purposes.

FARM FOR DISABLED.

A number of male insane of the hospital were kept at the farm during the year and employed at farm labor, with excellent results. The farm has continued to render a useful service. The net per capita cost for maintaining the disabled was $0.69, as compared with $1.93 for 1913.

BOARD OF HEALTH LABORATORY.

The following is a summary of work of special interest undertaken by the board of health laboratory staff during the year 1914.

An alleged outbreak of pneumonic plague in Colombia was investigated in May and found to be not plague but lobar pneumonia introduced into a susceptible native population. The death rate was high, and the epidemiologic features were somewhat similar to those seen in the outbreak of pneumococcus infections occurring among recently arrived West Indian and Colombian laborers in 1905–1907 in the Canal Zone.

A sanitary survey of the town of San Miguel, Pearl Islands, Bay of Panama, was made in November. Island malaria, entamebic and bacillary dysentery were encountered and data of medical and sanitary interest collected. The information was elicited that beriberi, which used to be rife among the pearl fishermen, was never encountered among the naked divers, who returned daily to the islands, but was met with exclusively among the contract divers, who used the helmet and were quartered and fed on boats which cruised around the islands, subsisting partly on canned provisions, and who frequently remained for months on the boats before coming ashore.

The preparation of a satisfactory smallpox vaccine was begun during the latter part of the year. This has resulted in a very material increase in the number of successful vaccinations made here, as well as reduced the cost of vaccine to the department.

The pathologic affinities of scurvy and beriberi were disclosed by the study of material from South Africa, and observations were made on infantile scurvy and infantile beriberi in two West Indian infants.

The insusceptibility of the native deer and the susceptibility of the sloth to *Tr. hippicum*—the trypanosome causing a fatal disease among horses in the Republic—was ascertained.

The subject of the physical and bacteriological behavior of germicides in emulsion, particularly "larvacide," has been pursued.

A series of microscopic examinations of smears from the placenta and peripheral blood of the mother has disclosed the interesting fact that the placenta sometimes affords an easy means of detecting malaria infection when the peripheral blood presents difficulties.

Data of some interest and importance have been collected relating to the subject of the breeding and feeding habits of *Stegomyia* and the common anophelines of the Canal Zone.

The tropical horse tick, *Dermacentor nitens*, undoubtedly the carrier of equine piroplasmosis of Panama, has been under observation and some facts of interest in its life history have been elicited.

Special pathologic studies of vascular syphilis among laborers employed on the canal have been made as well as analyses of the incidence of such pathological conditions as gallstones, duodenal and gastric ulcers, pancreatitis, pellagra, and hookworm disease.

Analyses of benign and malignant neoplasms encountered among employees during the past 10 years disclose some interesting features among which may be mentioned a higher incidence of carcinoma and sarcoma among negroes than has hitherto been recognized.

Daily examination of rats caught in Panama, Colon, and the Canal Zone have been made. During the last nine months of the year 8,104 rats were examined for plague and negative results were obtained in all. One suspicious bacterium obtained from the cervical gland of a rat worked out bacteriologically as a paracolon bacillus. Determination of the species of rats examined disclosed the following proportionate incidence of the different species: *M. norvegicus*, 54; *M. rattus*, 38; *M. alexandrinus*, 7; *M. musculus*, 60. It was noted that rats caught alive when received at the laboratory harbored as many as from 0 to 8½ fleas per rat; that when the rats were killed fleas began to leave the cadavers as early as fifteen (15) seconds after death, and after two hours and eight minutes the bodies were free from fleas. The flea infestation is very inconstant—some rats will harbor four or five fleas while others will have none. In October 44 rats harbored but 1 flea; in September 9 rats harbored 42 fleas; in April 7 rats harbored 62 fleas. The fleas were *Xenopsylla cheopsis*, the Indian rat flea. The method of catching the rat fleas was by combing and by the use of the chloroform box, but preferably by killing the rat by cephalotripsy and immediately placing it on a glass-rod grating over a large shallow collection of water. The fleas as they left the rat were picked out of the water by means of a pipette.

A number of pathological and biological specimens illustrative of local diseases as well as statistical charts and diagrams illustrating the sanitary and medical work in the Canal Zone, have been prepared for the Panama-Pacific Exposition.

INSANE DEPARTMENT.

The following is a report of the movement of patients in the asylum during the year:

	Employees.	Nonemployees.
Remaining January 1	30	250
Admitted	36	204
Died	1	50
Discharged	18	87
Transferred	22	68
Remaining December 31	25	249

The total number of admissions, discharges, deaths, etc. maintained an average as compared with other years.

Sixty inmates of both sexes, a majority of whom were West Indians, were deported, thereby relieving the department of a considerable expense for their maintenance.

After taking into consideration the therapeutic value of occupations for the insane, which practical experience has demonstrated to be the most powerful single means in the curative treatment of this class of patients, it was decided to avail ourselves of this measure, and to this end a number of male inmates were transferred

to the hospital farm at Corozal, and quartered in the building formerly used for Zone prisoners at that place. They were placed under the care of a male nurse and three attendants, and assigned to light work in clearing and planting about the gardens and fields. The benefits accruing to these inmates through such occupational diversion in the open air have been obvious and very encouraging.

When the institution at Ancon is ultimately removed to the new site at Corozal, where it will become an integral part of the farm, it is planned to afford congenial employment to a greater percentage of the patients, both male and female.

During the year the sewing and mending for the main hospital has been added to the work of the asylum sewing room, under the direction of an experienced seamstress, and has been very economically done. This, with the hand laundering, heretofore done at the asylum, whereby approximately all of the soiled linen of the insane is taken care of, provide regular employment for about 30 of the more tractable female patients, and many others of that sex are used in assisting in the ordinary routine work in the wards and dining room.

CHRONIC WARD.

On September 1, 1914, the chronic ward was transferred from Colon to Ancon Hospital. At the close of the year there were 28 chronic and incurable patients under treatment.

Detailed statistics are shown in Table XVIII.

Colon Hospital.

The old Colon Hospital grounds have been divided into two parts, the eastern end having been converted into a quarantine station, while the old buildings in the western end are used for the maintenance of an emergency hospital of 50 beds. Plans and estimates have been completed for a new and permanent hospital on this site, but no appropriation has yet been made. The dispensary formerly located at this point has been moved to and consolidated with Colon Hospital.

Detailed statistics are shown in Table XIX.

Tabonilla Sanitarium.

On January 1 the duties of the health department were withdrawn from the Tabonilla Sanitarium and the institution was turned over to the Panama Government for use as a hotel.

Detailed statistics are shown in Table XXI.

Palo Seco Leper Asylum.

A new [illegible] has been erected by the paid labor of the inmates, where the overcrowding among the male [illegible]

A new water system has been installed, which allows of the free use of water at all times, whereas previously it was necessary to [illegible] in some very important particulars.

tion of the asylum, its lack of telephone connections, and
nce on the Panama Canal for all necessities make a small
ch highly desirable, and one has been ordered.
eginning of the year there were 44 inmates. Fourteen
ere admitted during the year. There were 6 deaths, 1
and 2 transfers, leaving 50 patients in the asylum at the
year.
statistics are shown in Table XX.

Santo Tomas Hospital.

large increase in the number of inhabitants of the city
Santo Tomas Hospital has grown correspondingly, the
nber of patients being now more than 50 per cent greater
beginning of the year.
statistics are shown in Table XXII.

District Dispensaries.

camps have been abolished. The number of line dis-
as been reduced from 15, at the close of 1913, to 8, at the
4, and 2 of the 8 do not require the presence of a phy-

ons having the highest admission rates for malaria were
l Pedro Miguel with an average weekly percentage of
32, and the lowest, Gatun and Culebra, with 0.08 and

statistics are shown in Table IX.

SANITATION—CANAL ZONE.

ıber of sanitary inspection districts at the close of the
as compared with 12 at the close of 1913. All the sta-
west of the Canal, except Culebra, have been turned
military. The total cost of the division in 1914 was
, as compared with $343,085.82 for 1913. The percapita
e sanitation proper per day, based on the number of
was $0.009, as compared with $0.014 for 1913.
acter of the work done has been of the same general
ıat in previous years. The great hydraulic fills on the
the old line of the Panama Railroad, between Balboa,
l Corozal, have been about completed, while new fills
side of the Panama Railroad in the same vicinity are
g completion. These fills at first give us much trouble
ng mosquito breeding, which occurs at the edges of the
; but eventually they will be of great assistance to us
ıanent control of the mosquito situation.
which was done last spring in cutting down the borders
iguel River and Lake has been highly successful both
int of view of economy and efficiency.
statistics are shown in Table XXV.

LETTER OF TRANSMITTAL.

DEPARTMENT OF HEALTH,
Balboa Heights, Canal Zone, February 23, 1915.

Col. GEO. W. GOETHALS,
Governor of the Panama Canal,
Balboa Heights, Canal Zone.

SIR: I have the honor to submit the following report of the operations of the department of health for the calendar year 1914.

Very respectfully,

CHAS. F. MASON,
Chief Health Officer.

GENERAL REMARKS.

One case of smallpox was removed from the Pacific Mail Steamship *Newport* on April 16, and recovered. With this exception, no cases of yellow fever, smallpox, or plague originated on or were brought to the Isthmus during the year.

The department was completely reorganized on April 1, as set forth in detail in my annual report for the fiscal year. There has been a steady reduction in force and expenses throughout the year. The cost of the department for the year was $1,094,682.92, as compared with $1,484,941.09 for 1913. The average number of employees on the rolls during the year was 44,329, as compared with 56,654 for 1913.

There has been a large shifting of population from all along the line toward the Pacific end of the canal. Two new towns, La Boca and Balboa, have come into being, the former with a population of about 4,000, and the latter about 1,200.

A census of the Canal Zone has been taken three times during the year, the last showing a net decrease of more than 14,000 persons since January, 1913. More than half of our employees are now living in Panama. The census of Panama and Colon, taken in August and September, 1914, showed an increase in the population of these cities of 12,828 in Panama and 9,099 in Colon.

During the year a general vaccination was done in all the schools of the Canal Zone, as well as those of Panama and Colon; 117 children were vaccinated in the Canal Zone, 5,186 in Panama, and 1,097 in Colon. The percentage of "takes" in the Canal Zone was 67; in Panama, 80; and in Colon, 80. In addition to the vaccinations in the schools, 33,204 other vaccinations were done, with a percentage of 68 "takes."

A plan for a thorough annual physical examination of all gold employees has been approved and the work was started in December.

VITAL STATISTICS.

EMPLOYEES.

The health of employees has been better than in any previous year.

The total admission rate to hospitals for 1914 was 244.49, compared with 351.10 for 1913, and for disease alone 182.57, as compared with 246.91 for 1913.

The total death rate for 1914 was 7.04, as against 8.35 for 1913; and the death rate for disease 4.40, as compared with 5.24 for 1913. The noneffective rate for 1914 was 12.22, compared with 15.97 for 1913.

The changes in the regulations governing sick leave and admission to hospitals, which became effective soon after the reorganization, no doubt had some influence in reducing the admission and noneffective rates, but the fact that the death rate has also fallen decidedly shows that other factors are more important.

With regard to malaria, the death rate has been reduced more than 50 per cent since 1913 (0.16 in 1914, 0.37 in 1913), and the admission rate to hospitals more than 15 per cent (65 in 1914, 76 in 1913). The constantly noneffective rate, hospitals and quarters, which was only computed in the last five months of 1914, was 1.51.

There were no deaths from hemoglobinuric fever throughout the year; there were six such deaths in 1913.

In the latter half of the year a strong effort was made to compel employees suffering from malaria to continue the use of quinine after discharge from hospital for at least a month; failure to do so was punished by suspension or discharge. It is believed that this measure had had good effect.

Of the seven deaths from malaria four did not occur in hospital; one died without medical attendance, and in three others the diagnosis was clinical only, and therefore questionable.

The admission rate for typhoid fever 0.52 was more than 22 per cent less than for 1913, though the case mortality was higher, giving a death rate of 0.09 as against 0.07 for 1913.

In the latter half of the year a periodic physical examination, including urine and feces, has been made of all food handlers in the kitchens, mess rooms, and commissaries of the Panama Canal, with the result that one typhoid carrier and a number of cases of contagious diseases were detected and eliminated.

The admission rate for dysentery was 1.80 compared with 1.97 for 1913, but the death rate was slightly higher.

The death rate from pneumonia has increased from 0.83 in 1913 to 0.95 in 1914; all the deaths but one were among the black employees. The increase in the disease is probably due to unusual prevelance of measles and the overcrowded conditions in which the people live in Panama.

The five diseases causing the highest number of hospital admissions, with their rates, were as follows:

	Admissions.	Rate.
Malaria	2,884	65.06
Venereal diseases	1,001	22.58
Acute bronchitis	197	4.44
Mumps	122	2.75
Pneumonia	120	2.71

The five diseases causing the highest number of deaths, with their rates, were as follows:

	Deaths.	Rate.
Pneumonia	42	0.95
Tuberculosis	40	.90
Nephritis	22	.50
Heart, organic disease of	16	.36
Malaria	7	.16

Effects of Season.

The highest death rates for disease occurred in the months of March and May, and the lowest in November and August. The cause of the increased rates was an increase in the deaths from pneumonia and tuberculosis. The highest admission rates for disease were in January and March, and the lowest in November and May.

Effects of Race.

The admission rate to hospitals and death rate for disease for black employees were 191.93 and 4.63 per thousand, as compared with 523.63 and 3.13 from disease for white employees. The noneffective rate for disease and injuries for black employees per thousand was 10.16, as compared with 23.20 for white employees.

The admission rate to hospitals for malaria was 56.96 for blacks as compared with 108.06 for white employees.

The total death rate for Americans was 5.72, compared with 9.53 for Europeans; for disease, 2.67 for the former and 4.48 for the latter.

There were no deaths among Americans from malaria, dysentery, or typhoid fever during the year. The death rates among Europeans and blacks for these diseases were as follows:

	Europeans.		Blacks.	
	Deaths.	Rate.	Deaths.	Rate.
Malaria	2	1.12	5	0.13
Dysentery			4	.11
Typhoid fever			4	.11

Deportations.

The number of deportations was 176, divided as follows: Employees, 115; nonemployees, 61; disease, 140; and injury, 36.

Canal Zone.

With an average population of 46,379 in the Canal Zone there were a total of 710 deaths during the year; of these 614 deaths were from disease, giving a rate of 13.24 per thousand, as compared with 14.43 for the year 1913. The death rate from tuberculosis was 1.5; the percentage of all deaths was 10. But for the enormous infantile death rate among the negroes due to ignorance and indifference on the part of mothers, the showing would be still more favorable.

The birth rate based on the last five months of the year was 19. The infant mortality based on the same period was for white children under 1 year of age 29 per 1,000, and for colored children 347, with a general average of 252. Of the total deaths from disease, based on the last eight months of the year, the percentage under 5 years of age was 42.

Panama City.

The average population of the city for the year was 53,948, among whom there were a total of 1,863 deaths; of these, 1,772 deaths were from disease, giving a rate of 32.85 per 1,000, as compared with 30.21 for the preceding year. The death rates for malaria and dysentery were 1.91 and 0.69, respectively.

The birth rate based on the last five months of the year was 54.52. The infant mortality for the same period was 272.

Of the total deaths from disease based on the last eight months of the year the percentage under 5 years of age was 50.

The high death rate in Panama is due to several causes. It will be noted that 50 per cent of the deaths occurred in children under 5 years of age; they were due principally to gastrointestinal diseases, the result of ignorance and indifference on the part of mothers. Another factor of importance is the serious overcrowding in the tenement districts, the result of the rapid increase in the population of the city without a corresponding growth in housing facilities. In the recent census enumeration it was a frequent occurrence to find six or more persons sleeping in one unventilated room 10 by 10 feet. Tuberculosis gave a death rate of 4.26 and 12 per cent of the total deaths.

There was a small outbreak of beriberi commencing on July 21, with 1 case; 2 more cases were reported in August, and 16 in September; in October there were 2; November 4, and December 2; about half of the cases were from Chiriqui prison, the remainder were scattered, and a number were brought in from outside localities.

Out of 27 cases of typhoid fever which occurred in Panama, 20 were in the months of February to August, inclusive; nearly three-fourths of all the cases in the zone and Colon occurred in these same months, and were traceable to sewage-polluted oysters obtained in Panama.

COLON.

The average number of inhabitants for the year was 23,265, among whom there were 590 deaths; of these, 563 were from disease, giving a rate of 24.20 per 1,000 as compared with 22.74 for the year 1913. The death rates for malaria and dysentery were 0.86 and 0.17, respectively. The death rate for tuberculosis was 3.69, 14 per cent of the entire deaths from all causes.

The birth rate based on the last five months of the year was 48.60. The infant mortality for the same period was 194.

Of the total deaths from disease based on the last eight months of the year, the percentage under 5 years of age was 43.

DIVISION OF HOSPITALS.

There have been considerable reductions in the personnel of this division and the cost of same during the year. The number of employees on January 1, 1914, was 570, and on December 31, 1914, 392. The cost of the division was $883,356.49 in 1913, and for 1914, $596.858.24.

There were 919 charity patients admitted with a total of 49,939 days, as compared with 1,340 patients and 67,216 days in 1913. At a minimum average cost of $1 per day this represents an expenditure of about $50,000, of which $2,400 is returned by the department of civil administration.

The number of soldiers admitted to hospital increased from 405, with 5,938 days, in 1913, to 1,481, with 17,704 days, in 1914.

ANCON HOSPITAL.

The average number of patients constantly present in Ancon Hospital during the year was 929, as compared with 1,159 for 1913; the average number of employees constantly sick was 452 for 1914 and 674 for 1913.

The gross cost of the hospital for the year was $461,056.64, as compared with $529,282.74 for 1913.

Complete plans and estimates have been prepared for the reconstruction of Ancon Hospital on a permanent basis, but the necessary funds have not yet been appropriated. Two of the wards have been condemned and abandoned as unsafe. All the buildings to the west of the nurses' quarters have been removed to make the ground available for other purposes.

FARM FOR DISABLED.

A number of male insane of the hospital were kept at the farm during the year and employed at farm labor, with excellent results. The farm has continued to render a useful service. The net per capita cost for maintaining the disabled was $0.69, as compared with $1.93 for 1913.

BOARD OF HEALTH LABORATORY.

The following is a summary of work of special interest undertaken by the board of health laboratory staff during the year 1914.

An alleged outbreak of pneumonic plague in Colombia was investigated in May and found to be not plague but lobar pneumonia introduced into a susceptible native population. The death rate was high, and the epidemiologic features were somewhat similar to those seen in the outbreak of pneumococcus infections occurring among recently arrived West Indian and Colombian laborers in 1905–1907 in the Canal Zone.

A sanitary survey of the town of San Miguel, Pearl Islands, Bay of Panama, was made in November. Island malaria, entamebic and bacillary dysentery were encountered and data of medical and sanitary interest collected. The information was elicited that beriberi, which used to be rife among the pearl fishermen, was never encountered among the naked divers, who returned daily to the islands, but was met with exclusively among the contract divers, who used the helmet and were quartered and fed on boats which cruised around the islands, subsisting partly on canned provisions, and who frequently remained for months on the boats before coming ashore.

The preparation of a satisfactory smallpox vaccine was begun during the latter part of the year. This has resulted in a very material increase in the number of successful vaccinations made here, as well as reduced the cost of vaccine to the department.

The pathologic affinities of scurvy and beriberi were disclosed by the study of material from South Africa, and observations were made on infantile scurvy and infantile beriberi in two West Indian infants.

The insusceptibility of the native deer and the susceptibility of the sloth to *Tr. hippicum*—the trypanosome causing a fatal disease among horses in the Republic—was ascertained.

The subject of the physical and bacteriological behavior of germicides in emulsion, particularly "larvacide," has been pursued.

A series of microscopic examinations of smears from the placenta and peripheral blood of the mother has disclosed the interesting fact that the placenta sometimes affords an easy means of detecting malaria infection when the peripheral blood presents difficulties.

Data of some interest and importance have been collected relating to the subject of the breeding and feeding habits of *Stegomyia* and the common anophelines of the Canal Zone.

The tropical horse tick, *Dermacentor nitens*, undoubtedly the carrier of equine piroplasmosis of Panama, has been under observation and some facts of interest in its life history have been elicited.

Special pathologic studies of vascular syphilis among laborers employed on the canal have been made as well as analyses of the incidence of such pathological conditions as gallstones, duodenal and gastric ulcers, pancreatitis, pellagra, and hookworm disease.

Analyses of benign and malignant neoplasms encountered among employees during the past 10 years disclose some interesting features among which may be mentioned a higher incidence of carcinoma and sarcoma among negroes than has hitherto been recognized.

Daily examination of rats caught in Panama, Colon, and the Canal Zone have been made. During the last nine months of the year 8,104 rats were examined for plague and negative results were obtained in all. One suspicious bacterium obtained from the cervical gland of a rat worked out bacteriologically as a paracolon bacillus. Determination of the species of rats examined disclosed the following proportionate incidence of the different species: *M. norvegicus*, 54; *M. rattus*, 38; *M. alexandrinus*, 7; *M. musculus*, 60. It was noted that rats caught alive when received at the laboratory harbored as many as from 0 to 8$ fleas per rat; that when the rats were killed fleas began to leave the cadavers as early as fifteen (15) seconds after death, and after two hours and eight minutes the bodies were free from fleas. The flea infestation is very inconstant—some rats will harbor four or five fleas while others will have none. In October 44 rats harbored but 1 flea; in September 9 rats harbored 42 fleas; in April 7 rats harbored 62 fleas. The fleas were *Xenopsylla cheopsis*, the Indian rat flea. The method of catching the rat fleas was by combing and by the use of the chloroform box, but preferably by killing the rat by cephalotripsy and immediately placing it on a glass-rod grating over a large shallow collection of water. The fleas as they left the rat were picked out of the water by means of a pipette.

A number of pathological and biological specimens illustrative of local diseases as well as statistical charts and diagrams illustrating the sanitary and medical work in the Canal Zone, have been prepared for the Panama-Pacific Exposition.

INSANE DEPARTMENT.

The following is a report of the movement of patients in the asylum during the year:

	Employees.	Nonemployees.
Remaining January 1	30	250
Admitted	36	204
Died	1	50
Discharged	18	87
Transferred	22	68
Remaining December 31	25	249

The total number of admissions, discharges, deaths, etc. maintained an average as compared with other years.

Sixty inmates of both sexes, a majority of whom were West Indians, were deported, thereby relieving the department of a considerable expense for their maintenance.

After taking into consideration the therapeutic value of occupations for the insane, which practical experience has demonstrated to be the most powerful single means in the curative treatment of this class of patients, it was decided to avail ourselves of this measure, and to this end a number of male inmates were transferred

to the hospital farm at Corozal, and quartered in the building formerly used for Zone prisoners at that place. They were placed under the care of a male nurse and three attendants, and assigned to light work in clearing and planting about the gardens and fields. The benefits accruing to these inmates through such occupational diversion in the open air have been obvious and very encouraging.

When the institution at Ancon is ultimately removed to the new site at Corozal, where it will become an integral part of the farm, it is planned to afford congenial employment to a greater percentage of the patients, both male and female.

During the year the sewing and mending for the main hospital has been added to the work of the asylum sewing room, under the direction of an experienced seamstress, and has been very economically done. This, with the hand laundering, heretofore done at the asylum, whereby approximately all of the soiled linen of the insane is taken care of, provide regular employment for about 30 of the more tractable female patients, and many others of that sex are used in assisting in the ordinary routine work in the wards and dining room.

CHRONIC WARD.

On September 1, 1914, the chronic ward was transferred from Colon to Ancon Hospital. At the close of the year there were 28 chronic and incurable patients under treatment.

Detailed statistics are shown in Table XVIII.

COLON HOSPITAL.

The old Colon Hospital grounds have been divided into two parts, the eastern end having been converted into a quarantine station, while the buildings in the western end are used for the maintenance of an emergency hospital of 50 beds. Plans and estimates have been completed for a new and permanent hospital on this site, but no appropriation has yet been made. The dispensary formerly located at Cristobal has been moved to and consolidated with Colon Hospital.

Detailed statistics are shown in Table XIX.

TABOGA SANITARIUM.

On January 16 the forces of the health department were withdrawn from the Taboga Sanitarium and the institution was turned over to the supply department for use as a hotel.

Detailed statistics are shown in Table XXI.

PALO SECO LEPER ASYLUM.

A new building of four rooms has been erected by the paid labor of the patients in order to relieve the overcrowding among the male lepers.

A new water tank has been installed, which allows of the free use of water for all purposes at all times, whereas previously it was necessary to restrict the use in some very important particulars.

The isolation of the asylum, its lack of telephone connections, and its dependence on the Panama Canal for all necessities make a small power launch highly desirable, and one has been ordered.

At the beginning of the year there were 44 inmates. Fourteen patients were admitted during the year. There were 6 deaths, 1 discharge, and 2 transfers, leaving 50 patients in the asylum at the close of the year.

Detailed statistics are shown in Table XX.

Santo Tomas Hospital.

With the large increase in the number of inhabitants of the city of Panama, Santo Tomas Hospital has grown correspondingly, the average number of patients being now more than 50 per cent greater than at the beginning of the year.

Detailed statistics are shown in Table XXII.

District Dispensaries.

All sick camps have been abolished. The number of line dispensaries has been reduced from 15, at the close of 1913, to 8, at the close of 1914, and 2 of the 8 do not require the presence of a physician.

The stations having the highest admission rates for malaria were Corozal and Pedro Miguel with an average weekly percentage of 0.35 and 0.32, and the lowest, Gatun and Culebra, with 0.08 and 0.14.

Detailed statistics are shown in Table IX.

SANITATION—CANAL ZONE.

The number of sanitary inspection districts at the close of the year was 6, as compared with 12 at the close of 1913. All the stations to the west of the Canal, except Culebra, have been turned over to the military. The total cost of the division in 1914 was $172,941.50, as compared with $343,085.82 for 1913. The percapita cost of Zone sanitation proper per day, based on the number of employees, was $0.009, as compared with $0.014 for 1913.

The character of the work done has been of the same general nature as that in previous years. The great hydraulic fills on the west side of the old line of the Panama Railroad, between Balboa, Diablo, and Corozal, have been about completed, while new fills on the east side of the Panama Railroad in the same vicinity are approaching completion. These fills at first give us much trouble in controlling mosquito breeding, which occurs at the edges of the inundation; but eventually they will be of great assistance to us in the permanent control of the mosquito situation.

The work which was done last spring in cutting down the borders of Pedro Miguel River and Lake has been highly successful both from the point of view of economy and efficiency.

Detailed statistics are shown in Table XXV.

HEALTH OFFICES, PANAMA AND COLON.

A number of new and important sanitary ordinances, relating especially to rat-proofing against plague, and to the registration and reporting of births, deaths, and contagious diseases, have been adopted and put into effect in Panama and Colon, and the old ordinances are being rigidly enforced. The Panama Government has made some objection to the ordinance relating to births and deaths, but it is believed that this matter will be satisfactorily adjusted. In connection with the new ordinance relating to notification of infectious diseases, arrangements have been made with the board of health laboratory to make free examinations for all physicians to assist in the diagnosis of these diseases.

All the piers at both ends of the canal are being rat proofed, and two large rat-infested piers in Colon have been destroyed.

SANITATION—PANAMA.

Owing to the rapid growth in the population of the city of Panama, and the consequent considerable extension of the city toward the suburbs, much of the new construction had been in a very malarious locality, not hitherto requiring treatment; this will largely add to the expense of sanitation in that city, while the opening of many new streets and alleys has greatly increased the expense of street cleaning and garbage removal.

GENERAL SANITATION.

On April 1 a reorganization was made in the sanitary forces, reducing the number of districts in the city from five to four. Each sanitary inspector was given a small gang of laborers under his supervision with instructions to make a house to house inspection of his entire district once every seven days.

The routine work performed by these gangs consists in destruction of larvæ deposits, serving notices for correction of various forms of nuisances, and removing from private premises such material and rubbish as offer harboring and nesting places for rats.

District No. 1, known as the Calidonia-Guachapali district, which has a population of 18,000, and in which there is a good deal of antimalarial work to be carried on was provided with a larger force of men under the supervision of a sanitary inspector.

One inspector was assigned to the work of supervising the reconstruction of buildings to observe the rat-proofing features. One inspector gives his entire time to the supervision of street cleaning, and garbage collection and disposal. Another inspector has been filling the position of pure-food man, devoting his time to hotels, bottling works, bakeries, and dairies. An additional man has been spending his time chiefly in the work of vaccination and general utility work.

MOSQUITO, RAT, AND FLY WORK.

Mosquitoes.—Blue-print maps of the city have been put into use to determine the location of the occurrence of the greatest number of malaria cases. More than 90 per cent of all malaria for this city originates east of the Panama Railroad tracks.

In that district adjacent to the exposition grounds 39,905 feet of new ditches were constructed since September 1, being on either side of the Calidonia Road. Drip barrels and oil-soaked waste were placed to take care of the small streams and ditches in this district, and the use of knapsack sprays with oil and larvacide were also found of value.

Owners of lots who were holding same for speculation were notified in writing to perform the necessary work to prevent the breeding of mosquitoes, i. e., filling of pools and removal of vegetation from their property. Those failing to comply within a given time had the work performed by this office, and the expense billed to them. Cattle found at large on such vacant lots were first tagged, giving the owner a warning against a repetition of the nuisance, and if subsequently found at large the cattle were impounded, which resulted in some expense to the owner.

It has been found that the tracks of animals in the claylike soil afford very favorable breeding places for mosquitoes, and on this account a portion of the old unimproved Santa Ysabella Road was closed to use with barbed wire.

Old gutters punched in previous years were found to be containers, and many of these have been systematically removed. The ever-present red water jar is frequently found containing mosquito larvæ.

A lecture in Spanish was given on the mosquito and bottles of larvæ were placed in the public schools in an endeavor to awaken the interest of the Panaman youth, with undetermined results. It is proposed to carry out this plan each year, and should eventually have some effect on the mosquito situation in the city.

Rats.—A monthly average of 445 rats were taken along the water front in this city for examination for plague, and all the laboratory reports for the year have been negative. The cost per rat was a little less than 6 cents, including the cost of the bait, but not of the wear and tear on the traps.

Elevation of lumber in lumber yards was begun and the elevation of all scrap lumber on private premises was ordered as an antirat measure.

One of our inspectors, with a 1-gallon oil can, constructed a formaldehyde-gas generator, which he used very successfully with the aid of a three-eighths-inch rubber tube, in "smoking out" rats from their burrows. All possible openings of the rat-infested place were closed, with the exception of two, old sacking being stuffed into the holes. The potassium permanganate and formaline were placed in the generator, the tube inserted into one of the holes, and the men stood with clubs awaiting the exit of the rats, which was usually very prompt or not at all. This method is

very effective, particularly about old stables and old standing walls which have become rat burrows.

Flies.—Deposits of fly larvæ are reported daily by the sanitary inspectors, who destroy them with larvacide upon discovery. The lowest find for any month for 1914 was 289, the highest find being 1,336. In May flytraps of the Bath pattern were placed in the public market and proved very effective in the eradication of a number of flies at that place. Later these traps were removed to the public dump and supplemented by additional traps of a larger type, where they have been very successful in fly-catching. An average of 15 traps were in operation daily, and for the last four months of the year 676 quarts of flies were taken. It was found that decaying fish proved to be the best form of bait. Numbers of fly larvæ around the dump were destroyed by raking down of hot ashes upon them, and when this was impracticable, by application of larvacide. Ants and chickens were very helpful in the destruction of large numbers of larvæ, and after heavy rains it was commonly observed that many larvæ had been drowned.

Manure from the city stables, amounting to twenty-odd tons, is brought to the public dump daily for disposal, and up to date all attempts at cremation have been unsuccessful. The best that could be done was to place the manure in a large pile and thoroughly burn the edges to which point the fly larvæ would migrate. Although the interior of these piles would be smoldering we found on the top of the piles live fly larvæ, which would go to the stage of pupation, and large numbers of unhatched fly pupa would be discovered on these manure piles, which would seem to confirm the theory that it is necessary for the pupa to reach mother earth to successfully pupate. Manure heavily infested with fly larvæ was placed on the top surface of a manure pile and covered with a large flytrap. Daily inspection showed that practically no adult flies had been taken in this way, and the small house-fly pupa remained unhatched around and under the edges of the trap. Manure was placed in a zinc tub and permitted to become a depositing place for fly eggs. This was then covered with a specially designed flytrap, and after the pupation period had passed it was found that practically no flies had pupated, although large numbers of unhatched pupa were found remaining in the tub.

GARBAGE COLLECTION.

Eighty-five tons of garbage are collected daily in this city and hauled to the public dump for cremation. Cremation is successful in the dry months, but practically impossible during the heavy rains. In the better residence sections and in the shopping districts the garbage is collected at night.

Since April 1, 1,537 garbage cans have been placed in the city by this office, and of this number 856 have been provided with self-closing wooden covers, which have been found of very practical use in tenement houses. Many other cans were placed by local dealers.

STREET CLEANING AND SPRINKLING.

The cleaning and sprinkling of streets has been very effectively carried on for the year, and the expense for this and the garbage service account is lower for December than for any month since April 1.

PURE FOOD AND MISCELLANEOUS INSPECTIONS.

A board was appointed early in the year to decide upon a form of score cards for use in this city in connection with inspections of bakeries, hotels and restaurants, bottling works, dairies, and barber shops, and since the introduction of the scoring system, very marked improvement in all such establishments has been noted.

Through this means the health office has under supervision the following:

Bakeries	30
Bottling works	10
Hotels and restaurants	26
Barber shops	61
Dairies	61

An examination of the city milk supply is made at regular intervals and it has been found that generally the quality of the milk exceeds that of the requirements under the sanitary rules. A bacterial count was made in a few instances and found to be surprisingly satisfactory. The milk sale in the city is usually disposed of within a few hours after the milking hour.

WELLS.

During the last few months it was found that it was necessary as a sanitary measure to close certain wells in the city from which there had been water taken to be sold to the public.

Six such wells and tanks were closed and two others likewise sealed from which there was no selling of water. The practice of selling water from sources other than that of the reservoir is a menace to the public health and is to be discontinued.

BUILDINGS.

In reviewing the work carried on by the building department of this office, it is noted that since April 1, 1,229 permits of all kinds have been issued, of which 82 per cent have been completed.

The settlements of Trujillo and Pena Prieta were condemned and ordered to be removed, which work has almost been completed. This was undertaken on account of there being no water supply, streets, or sewers for these settlements, which had been for years a menace to the city. These houses were of the poorest type of construction and the occupants were constantly creating all forms of nuisances. A great many of these houses have been reerected by the owners in the village of Pueblo Nuevo, and others along the beach near Old Panama.

Permits for 216 new buildings have been completed since April 1, and the number of permits for repairs to old buildings amounts to

793. This work has been systematically carried on with the aid of a map of the city, and it has been the endeavor of the department to have all buildings in Panama placed in a sanitary condition with special reference to the rat proofing features, as provided in the sanitary regulations.

Detailed statistics are shown in Table XXV.

Sanitation—Colon.

During the past year the Colon health office has aimed at a comprehensive plan of operation by systematizing the various classes of work done so as to insure a well-rounded scheme of sanitation.

The inspection of all buildings, to secure conformity with the code has been carried out by one inspector covering the entire city of Colon daily. Cristobal was inspected weekly, as the quartermaster was also active there. The buildings in Mount Hope were inspected at least twice a week by the inspector there.

In Colon the old Pacific Mail Dock was condemned and removed, as well as Dock No. 1 of the Panama Railroad. The Panama Railroad Freight Depot and platform were rat proofed.

The old Hamburg-American building near Battery Morgan was condemned, and the beach in that section was cleaned up, having become in bad shape as a result of the construction work at Battery Morgan. The rear of the kitchen at the Washington Hotel was concreted to prevent fly breeding and to promote cleanliness there. A large number of buildings in Colon were condemned and either rebuilt or replaced by new structures, the most notable improvement probably being that on Front Street near the corner of Eleventh. Colon stables on Ninth Street were largely renovated, concrete sidewalks being installed in some cases and renewed in others, and the Arcia stables built in accordance with the regulations. The warehouse of the American Trading Co., on Broadway, which was badly rat infested was overhauled and made rat proof. Forty-three houses at Guava Ridge, 23 at Florencetown, and 16 at Mount Hope were condemned as hopelessly insanitary and destroyed.

An agreement was effected with the alcalde of Colon by which extensive repairs were effected in the sidewalks in many parts of the city.

The destruction and disinfection of garbage and manure was so carried on as to have reduced fly breeding in Colon to the irreducible minimum. The horns and hides from the slaughterhouse were cared for in such a way as to eliminate the fly breeding from that source which had formerly been a constant source of annoyance.

A successful experimental demonstration of the use of crude oil on one street in Colon during the recent dry month was made, and it is planned to extend this to other streets.

The work of beautifying and of protecting the Broadway Parkway, which is being done by the health office for the Panama Railroad, has been carried out. A number of specially interesting ornamental and economic plants and trees are being established there.

A considerable revenue has been derived from the sale of scrap and miscellany recovered at the dump.

The section known as Folks River Village was greatly improved by the construction of a concrete sea wall along the shore of that arm of the sea, which has long been a veritable dumping ground for all kinds of refuse. This sea wall makes a landing place for the cayucas and small schooners. This section also had curbing and sidewalks installed and platforms erected for the use of the charcoal traders.

The sewer system on Colon Beach was overhauled and improvements made by which long-standing nuisances were abated.

Garbage cans were put on the docks for the use of ships, and the old habit of polluting the dock basins with garbage was stopped.

A great saving in money and time was effected by an arrangement with the supply department by which the health office took over the collection of garbage and the grass cutting in Cristobal, consolidating that work with that done in Colon.

The examination of all premises and vacant lots was done by a weekly inspection by one inspector with a gang of laborers, to remove at once all nuisances requiring instant attention. This work resulted in the removal of an average of about three loads of trash and refuse daily in addition to the garbage. It also involved the serving of immediate notice on all violators of the code and on responsible property owners; the execution of the ordinance against stray dogs and domestic fowls and birds in the defined areas; the immediate discovery and repair of all sewer connections and installations found in bad order; the arrest of obstinate offenders against the code, and the prosecution of such cases in the alcalde's court.

For the purpose of seeing that the sanitary laws were fully carried out at all times, a weekly inspection was made at night.

Attention to food products and industrial establishments was carried out by daily inspection of the entire city, the commissary's various activities being handled directly by the health officer and the work in Colon directly by an inspector.

Of the 14 bakeries in Colon, all but two underwent considerable structural repairs at the initiative of this office, the two exceptions being two new bakeries. Five were condemned until the required repairs were made; two closed voluntarily pending these improvements. A number of employees in the bakeries were fined in the alcalde's court for violating the code and some were discharged by the bakers.

Retail stores in bakeries were required to keep bread in glass cases. The proper wrapping of bread sold was made the object of special effort. Street vendors of food products were required to use glass cases. Some 300 or more glass cases for bread and cooked food were installed in shops in Colon. Fruit stands were made to protect those fruits requiring it with glass cases, some of them using transparent celluloid. Bottling works were inspected daily, and some changes were effected in their arrangement. Samples of new bottled drinks were sent to the laboratory for examination.

The Colon market was inspected twice daily, some new tables were installed, and some fish and meat condemned. A private fish-storage place was condemned until satisfactorily arranged. Cattle for slaughter at the slaughterhouse were examined before being slaughtered, and better care of the turtles secured. The Folk's River meat market was brought to a better state of cleanliness and quantities of meat in shops condemned for fly breeding. A model fowl coop was made and installed for the benefit of the keepers of fowls, and a number of others made to order. The ordinance in regard to the keeping of fowls in certain districts was carried out.

A periodic examination of milk sold in Colon was instituted, as well as inspection of the dairies.

The use of sanitary drinking cups in the Cristobal and Colon hotels was provided, and also in the schools.

In the work against rat-infestation experiments with different types of traps were carried on, with the result that a modification of the type known as the Marti trap was found the most effective. This trap could not be obtained because of the war. The E. Z. K. trap is also quite effective as a killing trap. The monthly catch rose to 250 rats per month. There are both the Norwegian brown and the English black rats here, the former predominating. Poison was also used where indicated. It is noteworthy that cocoanuts proved an exceedingly attractive bait. Food boxes in stables were required to be metal lined against rats, and the fowl coops also.

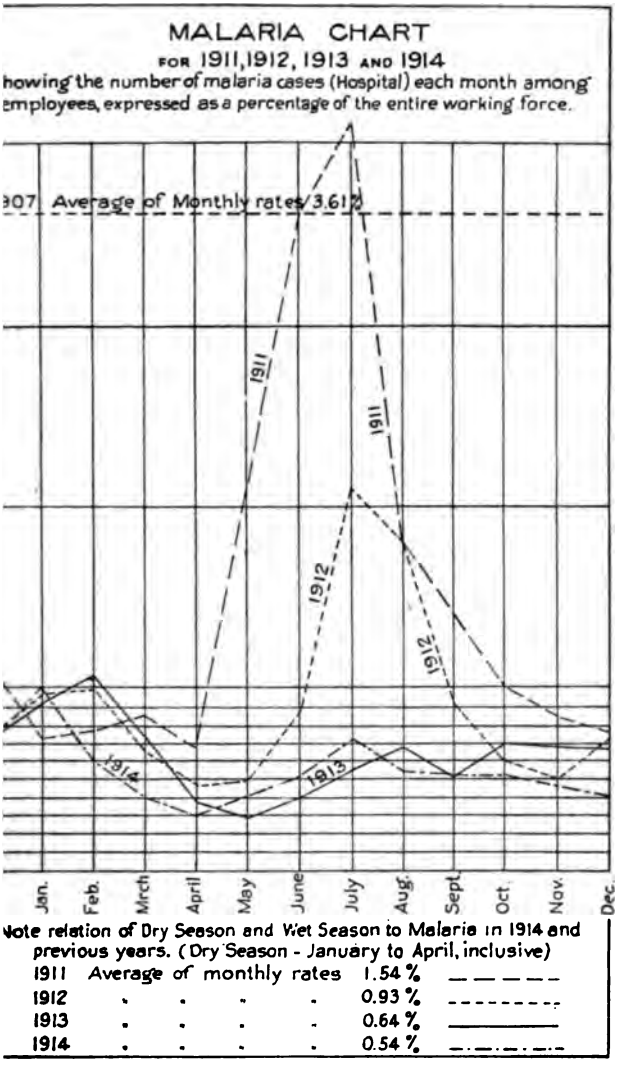
As regards mosquito eradication, the most notable work was the drainage of Mindi Island and the admission of sea water to places formerly full of fresh water. This work undoubtedly had much to do with the reduction of the mosquito catch from 1,000 to less than 50 daily. Other areas in Mount Hope district were also drained or flooded with sea water. The depopulation of certain places near old breeding grounds also seems to have led to a decrease in anopheles infestation and breeding. The filling in by dredges of some swamps in Mount Hope was commenced but had to be postponed on account of the construction of the east breakwater. The general effect of mosquito reduction may be discerned in the very low malarial rate in Colon for the latter part of the current year, the lowest, in fact, yet recorded here.

The cooperation of the principals of the schools has been obtained in the matter of reporting suspected cases of infectious disease and in regard to the vaccinating of pupils, and plans are on foot for special illustrated lectures on public health and hygiene, as well as for the inclusion of these subjects in the regular course of instruction in the Panamanian schools. All the school children in public and private schools were vaccinated under the direction of the health office.

The cooperation of the physicians of Colon was secured in reporting all notifiable diseases.

Arrangements were effected for the periodic disinfection of the city jails, and the central prison has been completely renovated.

The allocation of landing places for small vessels has been carried out by conference with other divisions and with the Panama


MALARIA CHART
FOR 1911,1912, 1913 AND 1914
showing the number of malaria cases (Hospital) each month among employees, expressed as a percentage of the entire working force.
1907 Average of Monthly rates 3.61%
1911
1911
1912
1912
1914
1913
Jan.
Feb.
Mrch
April
May
June
July
Aug.
Sept.
Oct.
Nov.
Dec.
Note relation of Dry Season and Wet Season to Malaria in 1914 and previous years. (Dry Season - January to April, inclusive)
1911 Average of monthly rates 1.54 %
1912 . . . . 0.93 %
1913 . . . . 0.64 %
1914 . . . . 0.54 %

Government, leading to concentration of these craft at places convenient for them and better arranged for sanitary purposes. The dredges in Colon Harbor have been regularly inspected and some sanitary improvements effected in most of them.

QUARANTINE DIVISION.

During the year the quarantine station at Culebra Island was removed to Balboa Dump, and the quarantine station at Colon from its old site to the new location in Colon Hospital grounds.

TABLE I.—ADMISSIONS, DEATHS, AND NONEFFECTIVE RATES FOR EMPLOYEES: DEATHS OF RESIDENTS OF PANAMA, COLON, AND THE CANAL ZONE.

ABSOLUTE NUMBERS.

Color.	Average number of employees.	Admission to hospitals.[1]			Deaths.			Noneffective from sickness.	
		Total.	Disease.	External causes.	Total.	Disease.	External causes.	Days treated.	Constantly noneffective.
Year 1914:									
White	7,024	3,678	3,028	650	47	22	25	59,480	162.96
Colored	37,305	7,160	5,065	2,095	265	173	92	138,350	379.04
Total	44,329	10,838	8,093	2,745	312	195	117	197,830	542.00
Year 1913:									
White	11,943	8,564	6,886	1,678	81	43	38	138,080	378.30
Colored	44,711	11,327	7,102	4,225	392	254	138	192,037	526.13
Total	56,654	19,891	13,988	5,903	473	297	176	330,117	904.43

PROPORTIONATE NUMBERS.[2]

Year 1914:									
White	7,024	523.63	431.09	92.54	6.69	3.13	3.56	.....	23.20
Colored	37,305	191.93	135.78	56.15	7.10	4.63	2.47	.....	10.16
Total	44,329	244.49	182.57	61.92	7.04	4.40	2.64	.....	12.22
Year 1913:									
White	11,943	717.07	576.57	140.50	6.78	3.60	3.18	.....	31.68
Colored	44,711	253.33	158.84	94.49	8.77	5.68	3.09	.....	11.76
Total	56,654	351.10	246.91	104.19	8.35	5.24	3.11	.....	15.97

[1] Admissions here mean discharges and deaths for 1913 and first 6 months of 1914, and admissions since then.
[2] Annual average per 1,000.

TABLE I.—ADMISSIONS, DEATHS, AND NONEFFECTIVE RATES FOR EMPLOYEES: DEATHS OF RESIDENTS OF PANAMA, COLON, AND THE CANAL ZONE—Continued.

DEATHS OF RESIDENTS OF THE CITIES OF PANAMA, COLON, AND THE CANAL ZONE

Place.	Population.	Deaths.			Annual average per 1,000.		
		Total.	Disease.	External causes.	Total.	Disease.	External causes.
Year 1914:							
Panama	53,948	1,863	1,772	91	34.53	32.85	1.68
Colon	23,265	530	503	27	25.36	24.20	1.16
Canal Zone	46,379	710	614	96	15.31	13.24	2.07
Total	123,592	3,163	2,940	214	25.59	23.86	1.73
Year 1913:							
Panama	47,172	1,507	1,425	82	31.95	30.21	1.74
Colon	20,232	489	460	29	24.17	22.74	1.43
Canal Zone	61,700	1,047	890	157	16.97	14.43	2.54
Total	129,104	3,043	2,775	268	23.57	21.50	2.07

TABLE II.—DEATHS BY AGE, COLOR, AND SEX.

Age.	White.			Colored.			Yellow.			Total.		
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.
Under 1 year	51	39	90	560	428	988	3	1	4	614	468	1,082
1 to 4 years	18	11	29	138	120	258	1	1	2	157	132	289
5 to 10 years	7	4	11	24	18	42	.....	.....	.....	31	22	53
11 to 20 years	10	6	16	46	58	104	.....	.....	.....	56	64	120
21 to 30 years	41	12	53	326	196	522	9	2	11	376	210	586
31 to 40 years	41	16	57	209	127	336	12	.....	12	262	143	405
41 to 50 years	28	10	38	122	82	204	6	1	7	156	93	249
51 to 60 years	22	10	32	90	37	127	1	.....	1	113	47	160
61 to 70 years	11	8	19	43	35	78	1	.....	1	55	43	98
71 to 80 years	3	6	9	12	23	35	2	.....	2	17	29	46
81 to 90 years	1	5	6	4	8	12	2	.....	2	7	13	20
91 to 100 years	.....	1	1	.....	1	1	.....	.....	.....	.....	2	2
Unknown	6	1	7	41	5	46	.....	.....	.....	47	6	53
Total	239	129	368	1,615	1,138	2,753	37	5	42	1,891	1,272	3,163

TABLE III.—DEATHS BY NATIONALITY.

Nations.	Employees.	Nonemployees.	Total.
Africa	.....	2	2
Antigua	4	13	17
Bahama Islands	1	.....	1
Barbados	90	299	389
Belgium	.....	1	1
Brazil	.....	1	1
Central America	.....	1	1
Chile	.....	2	2
China	.....	37	37
Colombia	6	87	93
Costa Rica	1	6	7
Cuba	1	4	5
Curacao	1	2	3
Demerara	.....	4	4
Denmark	.....	2	2
Dominica	1	4	5
Ecuador	1	4	5
England	1	4	5
Fortune Islands	3	1	4
France	.....	13	13
Germany	.....	6	6
Greece	2	2	4
Grenada	5	9	14
Guadeloupe	6	11	17
Guiana, British	.....	3	3
Guatemala	.....	1	1
Haiti	1	4	5
Honduras	.....	1	1
India	.....	4	4
Ireland	.....	1	1
Italy	1	14	15
Jamaica	97	544	641
Japan	.....	2	2
Martinique	14	57	71
Mexico	.....	5	5
Montserrat	3	5	8
Nassau	1	2	3
Nicaragua	1	2	3
Panama	11	1,479	1,490
Peru	1	4	5
Portugal	.....	1	1
Russia	1	1	2
Salvador	1	2	3
St. Domingo	.....	2	2
St. Kitts	1	3	4
St. Lucia	5	44	49
St. Thomas	1	4	5
St. Vincent	3	9	12
Spain	6	30	36
Sweden	1	2	3
Switzerland	1	1	2
Trinidad	3	21	24
Turks Island	1	.....	1
United States	32	51	83
Venezuela	.....	12	12
West Indies	.....	14	14
Unknown	3	11	14
Total	312	2,851	3,163

TABLE IV.—CAUSES OF DEATHS OF EMPLOYEES OF THE PANAMA CANAL AND PANAMA RAILROAD.

Causes of death.	White.	Colored.	Total.
Disease.			
Alcoholism, acute	1		1
Aneurism	1	3	4
Angina pectoris		1	1
Apoplexy	2	3	5
Arterio-sclerosis		1	1
Cancer of buccal cavity		1	1
Cancer and other malignant tumors of stomach and liver	1		1
Carbuncle	1		1
Cerebro-spinal fever		1	1
Cholecystitis	1		1
Diphtheria		1	1
Drug habit	1		1
Dysentery:			
Bacillary		1	1
Unclassified		3	3
Empyema		1	1
Encephalitis	1		1
Endocarditis, acute and chronic		3	3
Fever:			
Malaria		3	3
Malarial, estivoautumnal	2	2	4
Typhoid		4	4
Gangrene		1	1
Heart, organic disease of	2	14	16
Infection of unknown origin		3	3
Intestinal obstruction		3	3
Leuchemia, lymphatic		1	1
Liver, abscess of	1	3	4
Lungs, gangrene of		2	2
Meningitis, pneumococcus		3	3
Nephritis:			
Acute	1	2	3
Chronic	2	17	19
Oesophagus, stricture of		1	1
Pericarditis		1	1
Peritonitis, simple		2	2
Pharynx, disease of		1	1
Pneumonia	1	2	3
Pneumonia, lobar		39	39
Pyemia and septicemia, pneumococcic		2	2
Septicemia		3	3
Septicemia, purulent infection and	1	2	3
Stomach, disease of		1	1
Stricture of urethra		1	1
Syphilis		1	1
Sudden death		1	1
Tetanus	1	2	3
Tuberculosis:			
Abdominal		1	1
Disseminated		18	18
Genito-urinary organs		1	1
Miliary		2	2
Pulmonary	1	17	18
Uremia		1	1
Ulcer, duodenal		2	2
Urethra, disease of		1	1
Undiagnosed	1		1

TABLE IV.—CAUSES OF DEATHS OF EMPLOYEES OF THE PANAMA CANAL AND PANAMA RAILROAD—Continued.

Causes of death.	White.	Colored.	Total.
Violence.			
Accidental traumatisms, various	3	15	18
Drowning, accidental	6	35	41
Dynamite explosions	4	6	10
Electric shock	6	1	7
Homicides	1	2	3
Lightning		1	1
Railroad accidents	3	23	26
Suicides	2	3	5
Total	47	265	312

TABLE V.—DEATH RATES AMONG AMERICANS AND WHITE FOREIGN EMPLOYEES.

	Cases.	Cause of death.	Number of deaths.	Annual average per 1,000.
Average number of white employees from the United States.	5,240	Disease	14	2.67
		External causes	16	3.05
		All causes	30	5.72
Average number of white women and children from the United States.	3,795	Disease	17	4.48
		External causes	2	.53
		All causes	19	5.01
Average number of white employees and their families from the United States.	9,035	Disease	31	3.43
		External causes	18	1.99
		All causes	49	5.42
Total number of Americans on the Canal Zone.[1]	11,468	Disease	31	2.70
		External causes	24	2.09
		All causes	55	4.79
Average number of white foreign employees (mostly Spaniards).	1,784	Disease	8	4.48
		External causes	9	5.05
		All causes	17	9.53

[1] The figures representing the total number of Americans on the Canal Zone include employees and their families and the officers and men of the United States Army and their families stationed on the Isthmus.

TABLE VI.—CAUSES OF DEATHS OF EMPLOYEES AND CIVIL POPULATION AND PLACES WHERE CHARGEABLE.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
General diseases.				
Typhoid fever	8	2	4	14
Malaria	19	4	11	34
Malarial fever:				
Estivo-autumnal	31	7	16	54
Tertian	4			4
Quartan	1			1
Mixed		1		1
Undetermined	15		1	16
Clinical	28	8	5	41
Cachexia	4			4

TABLE VI.—CAUSES OF DEATHS OF EMPLOYEES AND CIVIL POPULATION AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
General diseases—Continued.				
Hemoglobinuric fever, malarial	1		1	2
Whooping cough	1		1	2
Diphtheria and croup	3		2	5
Croup			3	3
Influenza	1			1
Dysentery	25		2	27
Entamebic	5			5
Bacillary			1	1
Unclassified	7	4	3	14
Leprosy	2			2
Erysipelas	5			5
Hemoglobinuric fever, unqualified			1	1
Acute infections jaundice (Weil's disease)	1			1
Purulent infection and septicemia	5	2	6	13
Pyemia			1	1
Septicemia	9	4	4	17
Pyemia and septicemia, pneumococcic	2	1	1	4
Tetanus	17	2	4	23
Pellagra	37	9	3	49
Beriberi	12	1		13
Tuberculosis of the lungs	206	69	44	319
Acute miliary tuberculosis	3		4	7
Tuberculous meningitis	2	3		5
Abdominal tuberculosis	7			7
Pott's disease	1	1		2
Tuberculosis of other organs			1	1
Tuberculosis of the larynx	2	2		4
Tuberculosis of the genito-urinary organs			1	1
Disseminated tuberculosis	8	11	24	43
Rickets	3		1	4
Syphilis:				
Secondary	1			1
Tertiary	4	5	2	11
Hereditary	8	3	3	14
Period not stated	5	2	2	9
Gonorrheal orchitis and epididymitis		1		1
Cancer and other malignant tumors:				
Of the buccal cavity	3	1		4
Of the stomach and liver	8	1	2	11
Of the peritoneum, intestines, rectum	1	1		2
Of the female genital organs	9	2	1	12
Of the breast		1		1
Of other organs and of organs not specified	7		1	8
Other tumors (tumors of the female genital organs excepted)	1			1
Acute articular rheumatism	2		1	3
Chronic rheumatism and gout	1			1
Scurvy	2	2	1	5
Diabetes	1			1
Exophthalmic goitre		1		1
Leuchemia, lymphatic			2	2
Anemia, chlorosis	1		1	2
Chlorosis	1			1
Anemia:				
Primary, pernicious	3	1	1	5
Secondary, cause not determined			2	2
Other general diseases	1			1
Purpura hemorrhagica	1			1

TABLE VI.—CAUSES OF DEATHS OF EMPLOYEES AND CIVIL POPULATION AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
General diseases—Continued.				
Alcoholism:				
Acute or chronic	4	2	1	7
Acute	1	1	1	3
Chronic	4	1	.....	5
Drug habit	1	.....	1	2
Diseases of the nervous system and of the organs of special sense.				
Encephalitis	2	1	1	4
Simple meningitis	15	3	1	19
Cerebrospinal fever	1	.....	2	3
Pneumococcus meningitis	2	1	1	4
Other diseases of the spinal cord	.....	.....	1	1
Acute anterior poliomyelitis	2	.....	.....	2
Cerebral hemorrhage, apoplexy	23	19	9	51
Softening of the brain	3	1	3	7
Paralysis without specified cause	5	4	1	10
Other forms of mental alienation	1	.....	.....	1
Dementia precox	1	.....	.....	1
Epilepsy	2	2	1	5
Convulsions (nonpuerperal) (5 years and over)	1	.....	1	2
Convulsions of infants (under 5 years of age)	7	5	3	15
Other diseases of the nervous system	1	.....	1	2
Diseases of the ears	1	.....	1	2
Diseases of the circulatory system.				
Pericarditis	1	1	.....	2
Acute endocarditis	24	3	2	29
Malignant endocarditis	3	1	.....	4
Organic disease of the heart	45	32	36	113
Angina pectoris	1	2	1	4
Diseases of the arteries, atheroma, aneurysm, etc.	.....	1	.....	1
Aneurysm	1	2	4	7
Arteriosclerosis	21	4	3	28
Embolism and thrombosis	3	.....	1	4
Diseases of the veins (varices, hemorrhoids, phlebitis, etc.)	.....	.....	1	1
Hemorrhage: other diseases of the circulatory system	2	2	.....	4
Diseases of the respiratory system.				
Diseases of the larynx	.....	1	.....	1
Acute bronchitis	43	46	5	94
Chronic bronchitis	5	6	.....	11
Broncho-pneumonia	97	23	34	154
Pneumonia (unqualified)	62	5	8	75
Lobar pneumonia	55	22	34	111
Pleurisy	8	1	1	10
Empyema	1	1	.....	2
Pulmonary congestion, pulmonary apoplexy	5	1	1	7
Gangrene of the lungs	3	.....	4	7
Asthma	5	.....	1	6
Pulmonary emphysema	1	1	.....	2
Other diseases of the respiratory system (tuberculosis excepted)	5	1	1	7

VI.—CAUSES OF DEATHS OF EMPLOYEES AND CIVIL POPU-ATION AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
Diseases of the digestive system.				
es of the mouth and annexa	2			2
titis			1	1
es of the pharynx	1			1
ılar tonsillitis		1		1
ıre of the esophagus		1	1	2
)f the stomach	2			2
diseases of the stomach (cancer excepted)	1		1	2
gastritis	4	9	4	17
c gastritis	1	4	1	6
indigestion		3	1	4
ea and enteritis (under 2 years)	303	27	66	396
	21		3	24
ea and enteritis (2 years and over)	12	6	4	22
	4	1		5
ɔstomiasis		1		1
diasis	1			1
dicitis and typhlitis		1		1
appendicitis	5		1	6
, intestinal obstructions	1	2	2	5
hernias	1			1
nal obstruction	10	1	4	15
diseases of the intestines	2	2	1	5
nal ulcer			2	2
yellow atrophy of the liver	3			3
is of the liver	15	6	1	22
calculi	1			1
diseases of the liver	6			6
s of liver (unqualified)	7		2	9
s of the liver (entamebic)			2	2
rstitis		1	2	3
peritonitis (nonpuerperal)	7	3	5	15
diseases of the digestive system (cancer uberculosis excepted)	1			1
ıereal diseases of the genito-urinary system and anneza.				
nephritis	31	16	8	55
s disease (chronic nephritis)	97	26	22	145
disease of the kidney and annexa	4		1	5
nephrosis		2	2	4
of the urinary passages			1	1
s of the bladder	1			1
s of the urethra, urinary abscess, etc	3		3	6
rophy of prostate	1			1
tumor (noncancerous)	2		2	4
diseases of the uterus		1	1	2
nd other tumors of the ovary	1			1
itis and other diseases of the female genrgans	5		1	6
The puerperal state.				
its of pregnancy	1	1	1	3
iterine pregnancy	1		1	2
mesis gravidarum	1			1
n	2			2
al hemorrhage	2	2	1	5
its of labor, other	1			1

TABLE VI.—CAUSES OF DEATHS OF EMPLOYEES AND CIVIL POPULATION AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
The puerperal state—Continued.				
Puerperal septicemia	8	2	6	16
Puerperal albuminuria and convulsions	.....	1	.....	1
Eclampsia	7	2	1	10
Following childbirth (not otherwise defined)	.....	1	2	3
Puerperal insanity	.....	1	.....	1
Diseases of the skin and of the cellular tissue.				
Gangrene	1	1	.....	2
Carbuncle	.....	.....	1	1
Acute abscess	2	.....	.....	2
Pemphigus contagiosus	1	.....	.....	1
Diseases of the bones and of the organs of locomotion.				
Diseases of the bones (tuberculosis excepted)	1	1	.....	2
Osteomyelitis	3	.....	.....	3
Diseases of the joints (tuberculosis and rheumatism excepted)	1	.....	.....	1
Malformations.				
Congenital malformations (stillbirth not included)	5	2	2	9
Diseases of early infancy.				
Newborn child	.....	.....	1	1
Congenital debility, icterus, and sclerema	15	3	5	23
Premature birth	34	4	14	52
Congenital debility	20	26	15	61
Malnutrition	55	36	46	137
Other causes peculiar to early infancy (including various consequences of labor)	21	7	10	38
Lack of care	1	.....	1	2
Old age.				
Senility	5	6	9	20
Affections produced by external causes.				
Suicide by—				
Poisoning	2	.....	2	4
Hanging or strangulation	.....	.....	1	1
Drowning	.....	1	1	2
Firearms	10	.....	3	13
Cutting or piercing instruments	1	.....	2	3
Poisoning by food	.....	.....	1	1
Other acute poisonings	3	.....	1	4
Burns (conflagration excepted)	4	.....	1	5
Absorption of deleterious gases (conflagration excepted)	.....	.....	1	1
Accidental drowning	12	11	29	52
Traumatism by—				
Firearms	4	.....	2	6
Fall	2	5	4	11
Mines and quarries	.....	.....	2	2
Machines	4	2	.....	6
Other crushings (vehicles, railroads, landslides, etc.)	6	1	4	11

TABLE VI.—CAUSES OF DEATHS OF EMPLOYEES AND CIVIL POPULATION AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
Affections produced by external causes—Contd.				
Railroad traumatism	11	4	21	36
Dynamite traumatism	11	.....	6	17
Starvation	2	.....	.....	2
Lightning	.....	.....	1	1
Electricity (lightning excepted)	.....	.....	8	8
Homicide by—				
Firearms	11	1	.....	12
Cutting or piercing instruments	3	1	1	5
Other means	1	1	4	6
Fractures (cause not specified)	3	.....	.....	3
Other external violence	1	.....	1	2
Ill-defined diseases.				
Ill-defined organic disease	1	.....	1	2
Sudden death	4	1	1	6
Cause of death not specified or ill defined	16	2	18	36
Infections of undetermined origin	4	2	3	9
Total	1,863	590	710	3,163
Stillbirths	216	80	83	379
Grand total	2,079	670	793	3,542

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES, FOR THE CALENDAR YEAR 1914.

Diseases.	Admissions.		Deaths.	
	White.	Colored.	White.	Colored.
General diseases.				
Typhoid:				
Fever	13	10	.....	3
Bacillus carrier	.....	1	.....	.....
Prophylaxis	1	.....	.....	.....
Malarial fever:				
Estivo-autumnal	379	1,279	1	2
Tertian	108	172	.....	.....
Quartan	1	22	.....	.....
Undetermined	1	.....	.....	.....
Clinical	261	647	.....	.....
Cachexia	5	4	.....	.....
Hemoglobinuric fever, malarial	4	.....	.....	.....
Vaccinia	3	1	.....	.....
Measles	2	39	.....	.....
Scarlet fever	2	.....	.....	.....
Diphtheria and croup	.....	.....	.....	1
Influenza	96	11	.....	.....
Dysentery	.....	7	.....	.....
Entamebic	10	7	.....	.....
Bacillary	3	5	.....	1
Unclassified	3	45	.....	3

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES, FOR THE CALENDAR YEAR 1914—Continued.

Diseases.	Admissions.		Deaths.	
	White.	Colored.	White.	Colored.
General diseases—Continued.				
Erysipelas	2	2	.....	.....
Dengue	3	.....	.....	.....
Chicken pox	.....	8	.....	.....
Mumps	10	112	.....	.....
Hemoglobinuric fever, unqualified	1	2	.....	.....
Yaws	.....	2	.....	.....
Filariasis	.....	2	.....	.....
Acute infectious jaundice (Weil's disease)	1	1	.....	.....
Other epidemic diseases	2	.....	.....	.....
Purulent infection and septicemia	3	8	1	5
Pyemia	.....	2	.....	.....
Septicemia	.....	2	.....	.....
Pyemia and septicemia, pneumococcic	.....	.....	.....	2
Tetanus	1	1	1	2
Pellagra	.....	5	.....	.....
Beriberi	13	28	.....	11
Tuberculosis of the lungs	5	54	.....	5
Acute miliary tuberculosis	.....	1	.....	2
Tuberculous meningitis	.....	3	.....	1
Abdominal tuberculosis	.....	3	.....	.....
Tuberculosis:				
Bones and joints	.....	1	.....	.....
Other organs	.....	1	.....	1
Skin	.....	1	.....	.....
Genito-urinary organs	.....	1	.....	1
Tuberculous abscess	.....	2	.....	.....
Disseminated tuberculosis	.....	3	.....	18
Syphilis:				
Primary	4	6	.....	.....
Secondary	32	42	.....	.....
Tertiary	26	50	.....	1
Period not stated	22	215	.....	.....
Gonococcus infection	2	1	.....	.....
Gonorrhea	75	190	.....	.....
Gonorrheal arthritis	4	32	.....	.....
Gonorrheal bubo	2	11	.....	.....
Gonorrheal orchitis and epididymitis	16	18	.....	.....
Gonorrheal ophthalmia	.....	1	.....	.....
Soft chancre	45	157	.....	.....
Adenitis chancroidal	20	30	.....	.....
Cancer and other malignant tumors:				
Of the buccal cavity	1	1	.....	1
Of the stomach and liver	1	.....	1	.....
Of the peritoneum, intestines, rectum	1	.....	.....	.....
Of the female genital organs	1	1	.....	.....
Of the skin	1	1	.....	.....
Of others organs and of organs not specified	2	3	.....	.....
Other tumors (tumors of the female genital organs excepted)	14	6	.....	.....
Acute articular rheumatism	6	2	.....	.....
Chronic rheumatism and gout	5	1	.....	.....
Leuchemia lymphatic	.....	1	.....	1
Hodgkin's disease	.....	2	.....	.....
Anemia:				
Primary, pernicious	2	.....	.....	.....
Secondary, cause not determined	4	.....	.....	.....

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES, FOR THE CALENDAR YEAR 1914—Continued.

Diseases.	Admissions.		Deaths.	
	White.	Colored.	White.	Colored.
General diseases—Continued.				
Other general diseases	7	5	.....	.....
Serum disease	.....	1	.....	.....
Purpura hemorrhagica	1	.....	.....	.....
Alcoholism:				
Acute or chronic	1	3	1	.....
Acute	23	6	.....	.....
Chronic	4	4	.....	.....
Alcoholic psychosis	1	4	.....	.....
Chronic lead poisoning	1	.....	.....	.....
Other chronic poisonings	2	.....	.....	.....
Diseases of the nervous system and of the organs of special sense.				
Pneumococcus meningitis	.....	1	.....	3
Other diseases of the spinal cord	.....	2	.....	.....
Cerebro hemorrhage, apoplexy	2	3	1	1
Softening of the brain	.....	2	.....	.....
Paralysis without specified cause	3	5	.....	.....
Other forms of mental alienation	5	21	.....	.....
Dementia precox	4	16	.....	.....
Epilepsy	5	12	.....	.....
Hysteria	2	1	.....	.....
Neuralgia	9	4	.....	.....
Neuritis	30	4	.....	.....
Other diseases of the nervous system	9	10	.....	.....
Neurasthenia	23	5	.....	.....
Diseases of the eyes and their annexa	95	150	.....	.....
Follicular conjunctivitis	6	7	.....	.....
Trachoma	2	2	.....	.....
Diseases of the ears	57	32	.....	.....
Diseases of the circulatory system.				
Pericarditis	.....	4	.....	.....
Acute endocarditis	.....	2	.....	1
Malignant endocarditis	.....	1	.....	1
Organic diseases of the heart	15	34	1	9
Aneurysm	.....	2	1	2
Arterio-sclerosis	5	7	.....	1
Diseases of the veins (varices, hemorrhoids, phlebitis, etc.)	15	3	.....	.....
Hemorrhoids	44	38	.....	.....
Varicocele	31	3	.....	.....
Phlebitis	2	.....	.....	.....
Diseases of the lymphatic system (lymphangitis, etc.)	4	4	.....	.....
Lymphadenitis (nonvenereal)	36	58	.....	1
Hemorrhage; other diseases of the circulatory system	1	7	.....	.....
Diseases of the respiratory system.				
Diseases of the nasal fossæ	104	12	.....	.....
Adenoids vegetations	.....	2	.....	.....
Myiasis of nasal fossæ and sinuses	.....	1	.....	.....

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES, FOR THE CALENDAR YEAR 1914—Continued.

Diseases.	Admissions.		Deaths.	
	White.	Colored.	White.	Colored.
Diseases of the respiratory system—Continued.				
Diseases of the larynx	1	1		
Laryngitis	1	3		
Diseases of the thyroid body	2	4		
Acute bronchitis	97	100		
Chronic bronchitis	11	5		
Broncho-pneumonia	5	4	1	1
Pneumonia (unqualified)	1	2		
Lobar pneumonia	5	103		40
Pleurisy	16	102		
Empyema	1	3		1
Pulmonary congestion, pulmonary apoplexy	1			
Gangrene of the lungs				2
Asthma	7	18		
Pulmonary emphysema		1		
Other diseases of the respiratory system (tuberculosis excepted)	1	1		
Abscess of lungs	3	1		
Diseases of the digestive system.				
Diseases of the mouth and annexa	8	5		
Diseases of the teeth and gums	8	15		
Stomatitis		2		
Diseases of the pharynx	97	42		1
Pharyngitis	11	8		
Follicular tonsillitis	32	23		
Diseases of the esophagus		1		
Foreign body in the esophagus		1		
Stricture of the esophagus				1
Ulcer of the stomach	18	3		
Other diseases of the stomach (cancer excepted)	24	3		
Gastrectasis	1			
Acute gastritis	13	4		
Chronic gastritis	14			
Acute indigestion	13	18		
Colitis	3	2		
Diarrhea and enteritis (2 years and over)	24	12		
Colitis	6	11		
Ankylostomiasis	4	31		
Intestinal parasites	2			
Temiasis	2			
Appendicitis and typhlitis	12	1		
Acute appendicitis	42	8		
Chronic appendicitis	52	2		
Inguinal hernia	69	81		
Other hernias	7	1		
Intestinal obstruction				3
Other diseases of the intestines	77	15		
Constipation	44	12		
Duodenal ulcer	2	1		2
Acute yellow atrophy of the liver		1		
Cirrhosis of the liver	3	1		
Biliary calculi	4			
Other diseases of the liver	8	10		
Abscess of liver (unqualified)	2	2	1	1
Abscess of the liver (entamebic)	1	3		2

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES, FOR THE CALENDAR YEAR 1914—Continued.

Diseases.	Admissions.		Deaths.	
	White.	Colored.	White.	Colored.
Diseases of the digestive system—Continued.				
Cholecystitis	14	1	1	
Diseases of the spleen		2		
Simple peritonitis (nonpuerperal)	3			1
Other diseases of the digestive system (cancer and tuberculosis excepted)	4	1		
Nonvenereal diseases of the genito-urinary system and annexa.				
Acute nephritis	2	3	1	1
Bright's disease (chronic nephritis)	23	41	1	16
Other diseases of the kidney and annexa	18	10		
Movable kidney		1		
Pyelo-nephrosis	5	7		
Calculi of the urinary passages	8			
Diseases of the bladder	3	3		
Cystitis	6	3		
Diseases of the uretha, urinary abscess, etc.	8	18	1	1
Stricture of the uretha, nonvenereal	9	36		
Diseases of the prostate	1	2		
Chronic prostatitis		1		
Nonvenereal diseases of the male genital organs	21	41		
Hydrocele	13	34		
Uterine hemorrhage (nonpuerperal)	2	1		
Uterine tumor (noncancerous)		1		
Other diseases of the uterus	2	1		
Metritis	2			
Salpingitis and other diseases of the female genital organs	2	4		
Nonpuerperal diseases of the breast (cancer excepted)		2		
The puerperal state.				
Accidents of pregnancy		1		
Abortion		1		
Other accidents of labor	2	1		
Diseases of the skin and of the cellular tissue.				
Gangrene		1		1
Furuncle	32	21		
Carbuncle	7		1	
Acute abscess	45	72		
Phlegmon and cellulitis	37	30		
Scabies	1	1		
Pemphigus contagiosus	1			
Elephantiasis		2		
Dhobie itch	14	3		
Ulcer of the skin	8	52		
Tropical ulcer	1			
Ulcerating granuloma of the pudenda		1		
Impetigo contagiosa	4	2		
Urticaria	2	1		
Ingrowing nail	24	6		
Other diseases of the skin and annexa	35	20		

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES, FOR THE CALENDAR YEAR 1914—Continued.

Diseases.	Admissions.		Deaths.	
	White.	Colored.	White.	Colored.
Diseases of the bones and of the organs of locomotion.				
Diseases of the bones (tuberculosis excepted)	23	11	.....	.....
Caries (nontuberculous)	1	.....	.....	.....
Mastoid abscess	1	.....	.....	.....
Osteomyelitis	1	.....	.....	.....
Periostitis	2	3	.....	.....
Diseases of the joints (tuberculosis and rheumatism excepted)	4	1	.....	.....
Ankylosis	2	.....	.....	.....
Arthritis	11	18	.....	.....
Synovitis	3	.....	.....	.....
Amputations	4	34	.....	1
Other diseases of the organs of locomotion	65	52	.....	.....
Malformations.				
Congenital malformations (stillbirth not included)	3	1	.....	.....
Old age.				
Senility	.....	2	.....	.....
Affections produced by external causes.				
Suicide by poisoning	.....	1	.....	.....
Poisoning by food	12	33	1	.....
Other acute poisonings	3	2	.....	.....
Conflagration	.....	1	.....	.....
Burns (conflagration excepted)	9	47	.....	.....
Traumatism:				
By firearms	5	10	.....	.....
By cutting or piercing instruments	17	244	.....	.....
By fall	25	228	.....	6
In mines and quarries	1	56	.....	1
By machines	13	119	.....	1
By other crushings (vehicles, railroads, landslides, etc.)	47	164	1	6
Railroad traumatism	6	85	2	8
Dynamite traumatism	2	29	1	.....
Traumatism by landslides	4	11	.....	.....
Injuries by animals	.....	1	.....	.....
Starvation	.....	1	.....	.....
Heat exhaustion	.....	1	.....	.....
Electricity (lightning excepted)	4	3	1	.....
Homicide by cutting or piercing instruments	1	1	.....	.....
Fractures (cause not specified)	54	50	.....	.....
Dislocations	.....	5	.....	.....
Sprains	44	29	.....	.....
Other external violence	386	948	.....	.....
Ill-defined diseases.				
Ill-defined organic disease	2	.....	.....	.....
Infections of undetermined origin	21	15	.....	3
No disease	11	21	.....	.....
Feigned disease	.....	2	.....	.....
Total	3,669	7,068	21	189

NOTE.—The admissions referred to above represent discharges for first six months and admissions for the last six months of 1914.

TABLE VIII.—CONSOLIDATED HOSPITAL REPORT.

Hospitals.	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
Ancon Hospital.												
Panama Canal employees	179	340	2,909	5,294	15	121	3,000	5,288	28	49	45	176
Panama Railroad employees	8	51	396	990	3	33	389	963	3	11	9	34
Panama pay patients	....	2	....	5	....	....	....	2	....	5	....	....
Other pay patients	110	67	3,710	1,235	43	117	3,613	1,116	23	24	147	45
Charity patients	10	17	311	345	6	75	299	219	6	28	16	40
Insane employees	6	24	8	28	....	1	6	12	3	19	5	20
Insane nonemployees	23	227	33	171	4	46	13	74	10	58	29	220
Total	348	728	7,367	8,068	71	393	7,320	7,674	73	194	251	535
Corozal Farm: Panama Canal employees	9	36	5	36	....	....	4	27	2	10	8	35
Chronic ward: Charity patients	....	26	....	43	....	1	....	40	....	....	....	28
Colon Hospital.												
Panama Canal employees	5	11	232	542	2	14	203	413	27	115	5	11
Panama Railroad employees	1	11	77	318	....	13	69	217	6	87	3	12
Panama pay patients	....	....	29	83	2	14	15	32	11	36	1	1
Other pay patients	4	2	220	114	2	9	185	77	29	29	8	1
Charity patients	....	2	56	83	4	7	35	53	16	25	1	....
Total	10	26	614	1,140	10	57	507	792	89	292	18	25
Palo Seco Leper Asylum.												
Panama pay patients	2	28	1	8	1	5	....	....	....	....	2	31
Charity patients	2	13	....	5	....	....	....	1	....	2	2	15
Total	4	41	1	13	1	5	....	1	....	2	4	46
Taboga Sanitarium.												
Panama Canal employees	22	....	38	....	....	....	60	....	....	....	....	....
Pay patients	7	....	44	....	....	....	51	....	....	....	....	....
Total	29	....	82	....	....	....	111	....	....	....	....	....
Grand totals.												
Panama Canal employees	215	387	3,184	5,872	17	135	3,267	5,728	57	174	58	229
Panama Railroad employees	9	62	473	1,308	3	46	458	1,180	9	98	12	46
Panama pay patients	2	30	30	96	3	19	15	34	11	41	3	32
Other pay patients	127	69	3,974	1,349	45	126	3,849	1,193	52	53	155	46
Charity patients	18	58	367	476	10	83	334	313	22	55	19	83
Insane employees	6	24	8	28	....	1	6	12	3	19	5	20
Insane nonemployees	23	227	33	171	4	46	13	74	10	58	29	220
Total	400	857	8,069	9,300	82	456	7,942	8,534	164	498	281	669

TABLE IX.—CONSOLIDATED SICK CAMP REPORT.

Stations.	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
Gamboa	....	5	5	65	....	....	4	65	1	5	....	....
Porto Bello	....	1	17	88	....	....	13	82	4	7	....	....
Toro Point	1	....	8	8	....	....	2	1	7	7	....	....
Total	1	6	30	161	....	....	19	148	12	19	....	....

CONSOLIDATED REPORT OF EMPLOYEES TREATED IN QUARTERS.

	Admissions to quarters.			Days lost in quarters.		
	White.	Colored.	Total.	White.	Colored.	Total.
Naos Island	11	158	169	24	307	331
Ancon	887	471	1,358	1,929	1,730	3,659
Balboa	581	158	739	1,199	296	1,495
Corozal	916	53	969	1,518	96	1,614
Pedro Miguel	183	.....	183	320	.....	320
Paraiso	178	3	181	483	6	489
Culebra	200	411	611	542	1,069	1,611
Empire	451	188	639	1,241	638	1,879
Gatun	315	220	535	729	741	1,470
Colon	1,120	882	2,002	2,478	4,574	7,052
Porto Bello	19	.....	19	30	.....	30
Toro Point	27	24	51	39	61	100
Margarita Point	3	36	39	6	35	41
Total	4,891	2,604	7,495	10,538	9,553	20,091

TABLE X.—CONSOLIDATED HOSPITAL, SICK CAMP, AND ADMISSION TO QUARTERS REPORT.

	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
Hospitals	400	857	8,069	9,300	82	456	7,942	8,534	164	498	281	669
Sick camps	1	6	30	161	....	....	19	148	12	19	....	....
Total	401	863	8,099	9,461	82	456	7,961	8,682	176	517	281	669

TABLE X.—CONSOLIDATED HOSPITAL, SICK CAMP, AND ADMISSION TO QUARTERS REPORT—Continued.

	White.	Colored.	Total.
Total admissions to hospitals and sick camps, excluding Corozal Farm and chronic ward	8,094	9,382	17,476
Total admissions of employees to quarters	4,891	2,604	7,495
Total	12,985	11,986	24,971
Less number of patients transferred from sick camps and quarters to hospitals, and between hospitals whose admissions are duplicated in above figures	315	691	1,006
Net admissions to hospitals, sick camps, and quarters	12,670	11,295	23,965
Net admissions of employees to hospitals, sick camps, and quarters	8,356	9,444	17,800
Annual average per thousand of admissions of employees to hospitals, sick camps, and quarters	1,189.64	253.16	401.54

CONSOLIDATED DISPENSARY REPORT OF ALL CASES TREATED BUT NOT EXCUSED.

	Employees.			Nonemployees.			Total.		
	White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.
Naos Island	1,594	14,484	16,078	1	5	6	1,595	14,489	16,084
Ancon	15,178	26,169	41,347	9,965	11,369	21,334	25,143	37,538	62,681
Balboa	42,107	45,860	87,967	2,024	2,013	4,037	44,131	47,873	92,004
Corozal	21,778	19,540	41,318	7,368	1,177	8,545	29,146	20,717	49,863
Pedro Miguel	5,587	11,519	17,106	4,621	1,194	5,815	10,208	12,713	22,921
Paraiso	8,341	16,166	24,507	3,993	4,815	8,808	12,334	20,981	33,315
Culebra	6,526	13,139	19,665	4,173	5,789	9,962	10,699	18,928	29,627
Empire	8,187	10,278	18,465	4,135	3,420	7,555	12,322	13,698	26,020
Gamboa	748	3,425	4,173	292	2,181	2,473	1,040	5,606	6,646
Gatun	8,664	17,225	25,889	7,312	5,449	12,761	15,976	22,674	38,650
Colon	10,876	23,673	34,549	5,893	4,663	10,556	16,769	28,336	45,105
Porto Bello	1,642	3,073	4,715	278	792	1,070	1,920	3,865	5,785
Toro Point	1,397	2,163	3,560	99	173	272	1,496	2,336	3,832
Margarita Point	1,074	3,974	5,048	.....	.....	.....	1,074	3,974	5,048
Total	133,699	210,688	344,387	50,154	43,040	93,194	183,853	253,728	437,581

TABLE XI.—AVERAGE NUMBER OF EMPLOYEES CONSTANTLY SICK IN HOSPITALS, SICK CAMPS, AND QUARTERS.

	White.	Colored.	Total.
Ancon Hospital	124.50	327.60	452.10
Colon Hospital	7.59	22.37	29.96
Taboga Sanitarium	1.64	.....	1.64
Total	133.73	349.97	483.70

TABLE XI.—AVERAGE NUMBER OF EMPLOYEES CONSTANTLY SICK IN HOSPITALS, SICK CAMP, AND QUARTERS—Continued.

	Sick camps.			Sick in quarters.		
	White.	Colored.	Total.	White.	Colored.	Total.
Naos Island				0.07	0.84	0.91
Ancon				5.28	4.74	10.02
Balboa				3.28	.81	4.09
Corozal				4.16	.26	4.42
Pedro Miguel				.88		.88
Paraiso				1.32	.02	1.34
Culebra				1.48	2.93	4.41
Empire				3.40	1.75	5.15
Gamboa	0.05	1.84	1.89			
Gatun				2.00	2.03	4.03
Colon				6.79	12.53	19.32
Porto Bello	.28	1.05	1.33	.08		.08
Toro Point	.03	.02	.05	.11	.16	.27
Margarita Point				.02	.09	.11
Total	.36	2.91	3.27	28.87	26.16	55.03

AVERAGE NUMBER OF EMPLOYEES CONSTANTLY SICK.

	White.	Colored.	Total.
Hospitals	133.73	349.97	483.70
Sick camps	.36	2.91	3.27
Sick in quarters	28.87	26.16	55.03
Total	162.96	379.04	542.00

AVERAGE NUMBER OF EMPLOYEES CONSTANTLY SICK PER 1,000.

	White.	Colored.	Total.
Hospitals	19.04	9.38	10.91
Sick camps	.05	.08	.07
Sick in quarters	4.11	.70	1.24
Total	23.20	10.16	12.22

TABLE XII.—AVERAGE LENGTH OF STAY IN HOSPITALS OR QUARTERS FOR EACH ADMISSION OF SICK EMPLOYEES.

	White.	Colored.	Total.
Hospitals:			
Ancon Hospital	13.18	18.40	16.59
Colon Hospital	9.01	9.51	9.38
Taboga Sanitarium	9.98	.....	9.98
Total	12.80	17.37	15.82
Sick camps:			
Gamboa	3.80	9.61	9.23
Porto Bello	5.94	4.33	4.58
Toro Point	1.33	1.12	1.24
Total	4.26	6.39	6.06
Quarters:			
Naos Island	2.18	1.94	1.96
Ancon	2.07	3.67	2.69
Balboa	2.06	1.87	2.02
Corozal	1.66	1.81	1.67
Pedro Miguel	1.75	.....	1.75
Paraiso	2.71	2.00	2.70
Culebra	2.71	2.60	2.64
Empire	2.75	3.39	2.94
Gatun	2.31	3.37	2.75
Colon	2.21	5.18	3.52
Porto Bello	1.58	.....	1.58
Toro Point	1.44	2.54	2.00
Margarita Point	2.00	.97	1.05
Total	2.15	3.67	2.68

TABLE XIII.—SUBSISTENCE AND OPERATING EXPENSES.

	Hospitals.	Sick camps.	Total.
SUBSISTENCE EXPENSES.			
Number of days' rations issued to patients	378,653	3,359	382,012
Cost of rations issued to patients	$97,386.56	$680.87	$98,067.43
Cost of subsistence per patient per day	$0.257	$0.202	$0.256
OPERATING EXPENSES.			
Number of days' relief furnished patients	378,653	4,051	382,704
Cost of operation	$522,411.77	$1,126.72	$523,538.49
Cost per capita per day	$1.379	$0.277	$1.367
Cost of operation with amount received from outside patients, etc., deducted	$295,703.38	$1,090.72	$296,794.10
Cost per capita per day with above deduction	$0.78	$0.269	$0.775
Cost of dispensaries	.....	.....	$90,084.68

TABLE XIII.—SUBSISTENCE AND OPERATING EXPENSES—Contd.

Financial statement.

	Health department expenditures calendar year—	
	1913	1914
Administration	$58,957.43	$28,106.95
Medicinal storehouse	6,556.87	6,399.73
Ancon Hospital	529,282.74	461,056.64
Colon Hospital	164,822.73	34,099.71
Taboga Sanitarium	29,455.62	867.39
Santo Tomas Hospital	11,634.83	10,883.50
Other hospitals and dispensaries	148,160.57	89,951.00
Quarantine service	58,414.68	51,107.31
Sanitation, proper—Panama	34,874.31	34,904.10
Disposal of garbage, street cleaning—Panama	21,001.49	54,215.05
Sanitation, proper—Colon	27,578.62	26,368.42
Disposal of grabage, street cleaning—Colon	18,838.14	21,940.52
Sanitation, proper—Canal Zone	289,840.40	143,365.47
Disposal of garbage, etc., Canal Zone	53,245.42	29,576.03
Construction and repair of buildings	22,587.96	87,378.55
Operation of Corozal Farm	9,689.28	14,462.55
Total	1,484,941.09	1,094,682.92

NOTE.—The figures shown above for 1914 do not include $39,486.64 obligations for gratuity reserve. This is omitted in order to make comparison with expenditures for 1913, when no reserve for gratuity pay had been made.

TABLE XIV.—PATIENTS OTHER THAN EMPLOYEES TREATED IN HOSPITALS, INCLUDING PALO SECO LEPER ASYLUM, AND AMOUNTS RECEIVED FOR THEIR TREATMENT.

	Remaining Jan. 1.	Admitted.	Total.	Number of days treated.	Amount.
Paid for by Panama Republic:					
Insane	173	128	301	65,527	$49,172.58
Colon Hospital	.....	112	112	651	1,137.73
Lepers	30	9	39	11,334	8,476.50
Total	203	249	452	77,512	58,786.78
For whom department of civil government pays $2,400 per year (charity)	153	875	1,028	49,686	2,400.00
Outside pay patients	55	1,310	1,365	13,346	55,172.26
Families of employees, etc. (Zone)	103	2,432	2,535	44,537	45,936.95
Soldiers	38	1,481	1,519	17,704	21,473.10
Residents of Panama, emergency charity cases	1	44	45	253	.....
Operations [1]	.....	.....	.....	.....	35,421.27
Total	553	6,391	6,944	203,038	219,190.36

[1] The amount received for operations is for the first 10 months of the year, since which time the amounts received from this source are included in the amounst received from the different classes of patients mentioned above.

TABLE XV.—SURGICAL OPERATIONS PERFORMED IN HOSPITALS.

	Number.	Died.
Amputations:		
Shoulder	2	2
Forearm	4	.....
Hip joint	1	1
Thigh	4	1
Leg	6	2
Foot	4	.....
Digits, multiple	38	1
Leg, double	5	5
Arm and leg	1	1
Operations on bones:		
Craniectomy—		
Decompressive	8	2
Exploratory	1	.....
Laminectomy	3	2
Ostiectomy	21	.....
Excision of maxilla	1	1
Resection of—		
Shoulder	1	.....
Elbow	1	1
Ankle	1	1
Wiring of fractures—		
Simple	73	.....
Compound	25	1
Adenectomy:		
Cervical	38	.....
Axiliary	3	.....
Inguinal—		
Single	252	.....
Double	79	.....
Femoral	22	.....
Herniotomy:		
Inguinal—		
Single	133	.....
Double	48	.....
Femoral	4	.....
Ventral	16	.....
Strangulated	14	1
Genito-urinary tract:		
Nephrotomy	2	.....
Nephrectomy	2	.....
Nephropexy	2	.....
Perinephritic abscess, drainage of	1	.....
Ureterotomy	2	.....
Cystotomy	1	.....
Urethrotomy—		
Internal	37	.....
External	40	1
Prostatectomy	3	.....
Varicocele, radical cure	25	.....
Hydrocele—		
Single, radical cure	43	.....
Double, radical cure	8	.....
Orchidectomy	4	.....
Epididyotomy	103	.....
Amputation of scrotum	27	.....
Curetage uteri	92	.....
Genito-urinary tract—Con.		
Perineoplasty	18	.....
Trachelorrhaphy	21	.....
Vaginal sections	2	.....
Vaginal punctures	4	.....
Obstetrical:		
Cæsarian section, abdominal	4	1
High forceps	1	.....
Low forceps	29	.....
Version	26	.....
Perineorrhaphy	7	.....
Thorax:		
Thoracotomy	11	2
Thoracoplasty	2	.....
Excision of—		
Breast	1	.....
Breast and axilla	2	.....
Rectum:		
Hemorrhoids, radical cure	119	.....
Fistula in anus, excision of	7	.....
Prolapsus rectum, radical excision	3	.....
General:		
Thyroidectomy	11	.....
Aneurismorrhaphy	1	.....
Varicose veins, excision of	23	.....
Tenorrhaphy	17	.....
Excision of surface neoplasms	52	.....
Gunshot wound of soft parts, operation for	1	.....
Extensive injuries to soft parts, operation for	9	.....
Plastic operation for—		
Congenital defect	3	.....
Severe injuries	12	1
Effects of disease	14	.....
Skin graft	13	.....
Laparotomy:		
For general peritonitis	3	1
For tuberculous peritonitis	2	1
For intestinal obstruction	7	5
Exploratory	9	2
Gastrotomy	2	1
Gastro-enterostomy	5	1
Entero-enterostomy	3	1
Enterectomy	3	2
Appendectomy	213	1
Appendectomy with—		
Local peritonitis	27	1
General peritonitis	5	2
Cæcostomy	1	1
Colostomy	5	1

TABLE XV.—SURGICAL OPERATIONS PERFORMED IN HOSPITALS—Continued.

	Number.	Died.		Number.	Died.
Laparotomy—Continued.			Laparotomy—Continued.		
Cholecystostomy	16	1	Plastic operation for chronic pelvic peritonitis	43	.....
Cholecystectomy	7	1	For ectopic gestation	3	.....
Abscess of liver—			For trauma:		
Laparo-hepatotomy for	8	3	General peritonitis	2	1
Thoraco-hepatotomy for	5	2	Hematoperitoneum	2	2
Splenectomy	2	1	Rupture of—		
Pan-hysterectomy	6	.....	Liver	1	1
Supravaginal hysterectomy	47	1	Spleen	2	.....
Hysteromyomectomy	38	1	Gunshot wound of abdomen	1	.....
Myomectomy	6	.....	Stab wound of abdomen	2	.....
Salpingectomy—			Major operations, various other	65	.....
Single	8	.....	Minor operations, various	1,829	3
Double	6	.....	Total	4,060	60
Salpingo-oophorectomy	18	1			
Suspensio-uteri	44	1			

The above figures represent the number of operations performed; in some instances two or more are performed upon one patient.

TABLE XVI.—OPERATIONS AND WORK PERFORMED IN EYE, EAR, NOSE, AND THROAT CLINICS.

Operation.	Number.	Operation.	Number.
Adenectomy	138	Removal of foreign body from esophagus	2
Abscess, alveolar	1	Resection, internal rectus	1
Bowman's dilatation of lacrymal duct	3	Rhino plastic	2
Canthotomy	1	Sarcoma of nose, excision	1
Capsulectomy	8	Septal spurs	1
Cataract, needling	1	Sequestrotomy	1
Enucleation	4	Sinusotomy	7
Evisceration	4	Sinusotomy, nasal	3
Excision of chalazion	2	Submucous resection of nasal septum	131
Expression for trachoma	10	Suture, lacerated sclera	1
Extraction of cataract	16	Sublingual abscess, incised	2
Glaucoma, trephine	1	Tarsalectomy for trachoma	1
Iridectomy	21	Tenotomy	6
Lacrymal gland, excision	1	Tonsillectomy	270
Lingual abscess	1	Tucking:	
Mastoidectomy	9	Internal rectus	2
Ossiculectomy	1	External rectus	10
Plastic on ear	3	Turbinectomy	4
Plastic on eyelid	1	Various minor operations	523
Plastic on nose	4	Total	1,271
Polypoid growth tonsil removed	2	Refractions	2,195
Pterygium:		Outside cases treated	12,479
Excision	28	Grand total	15,945
Transplantation	35		
Resection, external rectus	2		
Removal of nasal polyp	6		

TABLE XVII.—CONSOLIDATED WARD LABORATORY REPORT OF ALL HOSPITALS.

	Number.		Number.
Blood examinations	12,946	Stool examinations—Contd.	
Estivo-autumnal	2,276	Cercomonas, intestinalis	45
Tertian	497	Bathriocephalus	1
Mixed tertian and estivo-autumnal	29	Urine examinations	23,883
Quartan	44	Albumen	7,026
Differential blood counts	727	Albumen and casts	5,273
Leucocyte counts	2,098	Sugar	60
Red blood counts	120	Pus and blood	4,917
White blood counts	41	Gonococci	3
Hemoglobin estimations	1,558	Indican	270
Relapsing fever	2	Epithelium	1,586
Stool examinations	9,189	Bile	123
Ascaris lumbricoides	368	Microscopical examinations	12
Uncinaria ova	1,215	Trichomonas vaginalis	8
Trichocephalus dispar	993	Hemin crystals	11
Strongyloides intestinalis	486	Guaiac tests	68
Tenia saginata	1	Ciliated monads	13
Ameba	43	Sputum examinations	2,100
Entameba	34	Tubercle bacilli	323
Ciliated monads	185	Ameba	6
Bilharzia	9	Blood	0
Pus and blood	1,266	Elastic tissue	2
Pus and epithelial cells	1	Miscellaneous examinations of—	
Balantidium coli	8	Pleural effusions	6
Oxyuris vermicularis	2	Various smears and discharges	349
Entameba, histolytica and tetragena	24	Spinal fluid	11
Guaiac tests	82	Vaginal and urethral discharges	149
Bismuth crystals	54		

TABLE XVIII.—ANCON HOSPITAL—NATIONALITY OF PATIENTS.

Class.	Number treated.	Americans.		Other nations.	
		White.	Colored.	White.	Colored.
Panama Canal employees	8,722	1,804	6	1,098	5,814
Panama Railroad employees	1,445	223	1	152	1,069
Panama pay patients	7	.....	.....	.....	7
Other pay patients	5,128	2,823	1	930	1,374
Charity patients	689	248	1	72	368
Insane employees	66	4	8	.....	54
Insane nonemployees	454	15	30	.....	409
Total	16,511	5,117	47	2,252	9,095

Number of days' relief furnished patients 338,339
Cost of subsistence per patient per day $0.251

TABLE XIX.—COLON HOSPITAL—NATIONALITY OF PATIENTS.

Class.	Number treated.	Americans.		Other nations.	
		White.	Colored.	White.	Colored.
Panama Canal employees	790	99	.....	132	559
Panama Railroad employees	407	47	.....	29	331
Panama pay patients	112	10	.....	21	81
Other pay patients	340	128	.....	101	111
Charity patients	141	33	.....	26	82
Total	1,790	317	.....	309	1,164

Number of days' relief furnished patients 15,338
Cost of subsistence per patient per day $0.336

NOTE.—Operations at Ancon and Colon Hospitals (see report of all surgical operations). Laboratory reports of Ancon and Colon Hospitals (see consolidated ward laboratory report).

TABLE XX.—PALO SECO LEPER ASYLUM—NATIONALITY OF PATIENTS.

Class.	Number treated.	Americans.		Other nations.	
		White.	Colored.	White.	Colored.
Panama pay patients	39	.....	.....	3	36
Charity patients	20	.....	.....	2	18
Total	59	.....	.....	5	54

Number of days' relief furnished patients 17,729
Cost of subsistence per patient per day $0.274

TABLE XXI.—TABOGA SANITARIUM—NATIONALTITY OF PATIENTS.

Class.	Number treated.	Americans.	Other nations.
Panama Canal employees	60	59	1
Pay patients	51	50	1
Total	111	109	2

Number of days' relief furnished patients 524
Cost of subsistence per patient per day $0.692

NOTE.—No colored patients treated at Taboga Sanitarium.

TABLE XXII.—SANTO TOMAS HOSPITAL.

Class.	Remaining Jan. 1.	Admitted.	Died.	Discharged.	Remaining Dec. 31.
Pay cases	16	1,323	26	1,263	50
Charity patients	336	9,636	757	8,770	445
Total	352	10,959	783	10,033	495

Average number of days' treatment per patient	13.10
Average number of patients constantly sick	388.22
Number of days' relief furnished patients	141,702
Cost of subsistence per patient per day	$0.24

NATIONALITY.

Class.	Number treated.	Americans.		Other nations.	
		White.	Colored.	White.	Colored.
Pay cases	1,339	19	.....	537	783
Charity patients	9,972	18	.....	1,037	8,917
Total	11,311	37	.....	1,574	9,700

OPERATIONS.

	Number.	Died.
Major	1,188	34
Minor	451	.....
Total	1,639	34

DISPENSARY.

Class.	White.	Colored.	Total.
Natives	974	4,116	5,090
Foreigners	1,071	3,750	4,821
Total	2,045	7,866	9,911

TABLE XXIII.—BOARD OF HEALTH LABORATORY.

	Number.
Bacteriological examinations	
Water	5
Milk	15
Fluids and exudates	36
Blood cultures	230
Throat cultures (diphtheria suspects)	264
Cultures from autopsies	57
Cultures from eye	4
Stool cultures	989
Urine cultures	1,157
Sputum	8
Pus	22
Hydrocele fluid	1
Knee-joint fluid	13
Spinal fluid	25
Various smears and specimens	15
Pleural fluid	1
Plague suspect	1
Fluid from chest	3
Hand lesion	1
Abdominal fluid	3
Fluid from pleural cavity	2
Fluid from gall bladder	4
Panama oysters (consignments)	2
For quarantine officer	2
Curetage	2
Placenta	1
Lymphnode	1
Autopsy material (veterinary)	3
Oysters	1
Feces for uncinaria	2
Rats	1
Determinations: Moisture and volatile matter in soil	6
Examinations:	
Stomach contents	2
Leper suspects	28
Animals	63
Rats	8,104
Microscopic, for chief quarantine officer	17
Blood of employees, for malaria	158
Provisions	3
Chemical examinations:	
Pancreatic cyst	1
Oleum rinci	1
Boric acid	1
Chloral	1
Carbolic acid	1
Specimen for division of police	1
Urinary calculus	2
Stools	1
Sodium phosphate	1
Alcoholic beverages	4
Powder	1

	Number.
Chemical examinations—Continued.	
Gallstones	1
Stomach contents	16
Urine	399
Various liquids, fluids, etc	103
Various metals	1
Paste	1
Sugar cane	2
Oil, transformer-room	5
Brass borings	2
Cottonseed hulls and meal	2
Seeds of I plant, Cassia occidentalis L. (coffee senna)	1
Pyrene (fire extinguisher)	2
Drugs and chemicals, for purity	69
Preparation of dark fluid and U-tube, for testing hydroelectric plant, Gatun	1
Vomitus	1
Larvacide, to determine deterioration	1
Milk	145
Limestone, Corozal Farm	1
Liquid substance (poison), for division of police	2
Dairy feed	12
Flour	2
Agglutination reactions [1]	77
Autopsies [1]	372
Bodies embalmed [1]	66
Pathological tissues prepared, frozen [1]	266
Pathological tissues prepared, paraffin [1]	4,180
Surgical pathological tissues and neoplasms reported [1]	306
Vaccinations, antipest [1]	5
Vaccination, smallpox [1]	14
Vaccine inoculations, antityphoid [1]	39
Vaccine treatment, autogenous, prepared [1]	36
Water, sanitary analysis of [1]	1
Wasserman reactions [1]	2,851
Microscopic examination of stools [1]	4
Preparations of salvarsanized serum for intraspinous treatment [1]	5
Medical legal investigations [1]	5
Preliminary work on preparation of smallpox vaccine.	

[1] Not included under the heading "Chemical examinations."

TABLE XXIV.—ISSUES OF QUININE.

Month.	Kilograms.	Pounds, avoirdupois.	Month.	Kilograms.	Pounds, avoirdupois.
January	34.5	76.06	September	37.00	81.57
February	47.00	103.62	October	21.00	46.30
March	29.2	64.38	November	22.50	49.60
April	32.00	70.55	December	12.10	26.68
May	12.00	26.46			
June	43.00	94.80	Total	321.30	708.36
July	20.00	44.09	Average per month	26.775	59.03
August	11.00	24.25			

TABLE XXV.—SANITATION.

CITY OF PANAMA.

Mosquito, rat, and fly work:	
Miles of ditches cleaned	116.6
Miles of ditches dug	7.4
Cess pools cleaned	11
Cubic yards of earth used in filling cesspools, wells, and holes	4,035
Square yards pools oiled	587,784
Water containers treated	524,610
Mosquito-breeding places found	6,225
Fly-breeding places found	6,277
Quarts of flies trapped	676
Rats trapped	1,952
Disinfection work:	
Houses disinfected for diphtheria	2
Houses disinfected for chickenpox	1
Houses disinfected for scarlet fever	2
Houses disinfected for measles	1
Houses disinfected for typhoid fever	3
Houses disinfected for simple meningitis	1
Cubic feet disinfected	108,700
Rooms disinfected	32
Material used:	
Crude oil, gallons	3,116
Larvacide, do	6,784
Inspection of houses and yards:	
Houses and yards inspected	45,690
Notices served and nuisances abated	996
Old buildings condemned	1,021
Buildings demolished	290
Yards cleaned	2,535
Loads of refuse removed from the city	4,219
New buildings:	
Plans for new buildings approved	375
Permits granted for repairs to old buildings	1,064
Garbage collection:	
Loads of garbage removed to dump and burned	49,807
Total number of cans of garbage emptied	842,647
Total number of garbage cans placed	1,537
Street cleaning:	
Square yards of streets cleaned daily	566,667
Square yards of streets sprinkled daily	92,222
Persons vaccinated	13,111

COLON, CRISTOBAL, MOUNT HOPE, AND TORO POINT.

Water and sewers:	
Connections made during the year	45
Total connections made to date	1,166
Outstanding permits	509
Houses in which extensions were made	50
Houses:	
Plans approved	44
Permits to repair issued	671
Permits to occupy issued	42
Temporary permits to occupy issued	6
Bills collected for work for private parties	114
Sanitation of Colon:	
Loads of yard garbage removed	5,594
Average number of cans of garbage removed daily	2,252
Acres of vegetation removed	176
Acres of streets cleaned	9,878
Private properties cleaned	893
Square yards of pools oiled	296,250
Mosquito-breeding places destroyed	1,402
Water receptacles treated	312,469
Linear feet of ditches constructed	383
Miles of ditches maintained	14.1
Notice to abate nuisances served	1,121
Nuisances abated	1,717
Buildings inspected	43,199
Rats killed	1,242
Square yards of alleys cleaned	6,730,433
Square yards of streets sprinkled	398,000
Fly-breeding places destroyed	961
Gallons of larvacide used (7 months)	2,725
Gallons of crude oil used	1,382
Doses of quinine issued	38,999
Dogs killed	170
Cubic feet disinfected	517,824
Cubic feet fumigated	8,400
Colon and Cristobal garbage disposed of at dump, Colon.	
Sanitation of Cristobal:	
Square yards of pools oiled	49,200
Water receptacles treated	42,979
Mosquito-breeding places destroyed	208
Mosquitoes killed in barracks	4,857
Fly-breeding places destroyed	108
Mosquitoes killed in cars	2,185
Buildings inspected	2,360
Gallons of larvacide used (7 months)	209
Gallons of crude oil used	416
Loads of yard garbage removed	273
Cans of garbage removed	31,869
Square yards of vegetation removed	243,785
Sanitation of Mount Hope:	
Square yards of pools oiled	999,550
Water receptacles treated	215,100
Miles of ditches maintained	67.4
Mosquito-breeding places destroyed	1,640
Miles of ditches constructed	6.6
Mosquitoes killed in outfit cars	40,932
Mosquitoes killed in barracks	137,791
Gallons of crude oil used (7 months)	15,588
Gallons of larvacide used (7 months)	2,314
Rats killed	7
Cans of garbage removed	7,386
Square yards of vegetation removed	390,796
Mount Hope Cemetery maintained.	

Sanitation of Toro Point:	
Square yards of pools oiled	57,332
Water receptacles treated	11,240
Mosquito breeding places destroyed	60
Linear feet of ditches maintained	39,470
Doses of quinine tonic distributed	12,195
Cubic yards of old ditches reconstructed	1,353
Adult mosquitoes killed	5,700
Pit closets oiled	12
Fly-breeding places destroyed	4
Gallons of larvacide used (seven months)	108
Gallons of crude oil used (seven months)	439
Persons vaccinated	1,458
Mindi Island:	
Square yards filling in low places	4,404
Square yards vegetation removed	20,900
Linear yards of ditches constructed	7,727
Linear yards of ditches maintained	830
Wooden culvert constructed	1

CANAL ZONE.

Work requests on quartermaster's department:	
Grass cutting	130
Screen repairing	179
Miscellaneous	963
Work requests on engineering department	208
Work requests on other departments	25
Notice served for abatement of nuisances	732
Arrests for violation of sanitary regulations	39
Convictions	36
Building permits approved	32
Inspections of closets	33,195
Inspections of stores	2,171
Inspections of restaurants	501
Inspections of shops	1,825
Garbage cans emptied	1,495,260
Closets disinfected	68,746
Houses disinfected	68
Rat traps used daily	1,201
Water and sewer connections made	2
Adult anopheles destroyed at houses	114,802
Adult culices destroyed at houses	181,385
Containers found with stegomyia larvæ	45
Adult stegomyia destroyed in houses	32
Material used:	
Larvacide ..... gallons	42,945
Crude oil ..... do	263,450
Rats destroyed	8,954

TABLE XXVI.—QUARANTINE SERVICE.

PORTS OF PANAMA-BALBOA AND COLON-CRISTOBAL.

Vessels inspected and passed	1,496
Vessels detained in quarantine	141
Vessels fumigated on arrival	124
Vessels fumigated prior to departure	38
Pieces of baggage handled and stored	2,377
Crew inspected	127,306
Passengers inspected	64,695
Total persons inspected	192,001

Persons vaccinated at ports of arrival because of compulsory vaccination law	8,464
Persons vaccinated at ports of departure or en route because of compulsory vaccination law	15,967
Total persons vaccinated	24,431
Persons held in quarantine at the detention stations to complete period of incubation of yellow fever or plague	4,281
Persons held in quarantine on board vessels to complete period of incubation of yellow fever or plague	19,513
Total persons held in quarantine	23,794
Persons landed from foreign ports:	
Cabin	23,011
Steerage	17,058
Total	40,069
Persons embarked for foreign ports:	
Cabin	24,352
Steerage	26,243
Total	50,595
Apparent decrease for the year from foreign ports:	
Cabin	1,415
Steerage	9,185
Total	10,600
Persons arriving from coast towns on small craft	29,000
Persons embarked for coast towns on small craft	24,708
Apparent increase for the year from coast towns	4,292
Total persons landed	69,069
Total persons embarked	75,303
Excess over number landed	6,234
Less number for Pacific ports	3,247
Total apparent decrease for the year	9,481
Immigrants recommended for rejection	90
Certificates issued to outgoing passengers	334
Persons refused certificates because of trachoma	21
Bills of health viséed	1,122

BOCAS DEL TORO.

Vessels inspected and passed	343
Crew inspected and passed	17,151
Passengers inspected and passed	7,972
Passengers, in transit, inspected and passed	4,368
Persons held to complete period of incubation of yellow fever	37
Persons held to complete period of incubation of plague	18
Vessels fumigated	1

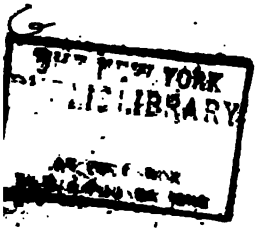
TABLE XXVII.—PERSONNEL REPORT.

[Average monthly number of employees at work during year.]

	1914	1913	December 31, 1914.		
			Officers and employees.	Skilled and unskilled labor.	Total.
Chief health office	13	33	4		4
Medical store	8	9	4	4	8
Quarantine service	40	40	23	19	42
Health office:					
Panama	142	83	21	131	152
Colon	130	127	18	102	120
Ancon Hospital	431	548	236	111	347
Colon Hospital	30	166	12	11	23
Santo Tomas Hospital	5	6	5		5
Taboga Sanitarium		21			
Palo Seco Leper Asylum	19	14	11	6	17
Zone sanitation	125	224	19	78	97
Hospital farm	47	22	2	41	43
Dispensaries:					
Ancon	5	5			
Balboa	6	4	6		6
Bas Obispo		4			
Corozal	5	5	5		5
Cristobal	4	6			
Culebra	4	7	3		3
Empire	5	6			
Frijoles		1			
Gatun	5	9	4		4
Gorgona		6			
Las Cascadas		4			
Margarita Point	1	1	1		1
Miraflores		3			
Naos Island	2	2	1		1
Paraiso	4	4	4		4
Pedro Miguel	3	4	3		3
Porto Bello	3	4			
Toro Point	2	3			
Gamboa	1		1		1
Total	1,040	1,371	383	503	886

TABLE XXVIII.—HOSPITAL CASES OF MALARIA AMONG EMPLOYEES.

Month.	Discharges.		Died.		Total cases.	Annual average death rate per 1,000.	Annual average cases per 1,000.	Number of employees.
	White.	Colored.	White.	Colored.				
January	115	371	0	0	486	0.00	118	49,328
February	76	207	0	0	283	.00	69	49,459
March	59	122	0	1	182	.26	47	46,611
April	44	99	0	0	143	.....	36	47,748
May	56	143	0	0	199	.....	50	48,039
June	73	174	0	0	247	.....	62	47,579
Admissions.								
July	80	259	0	0	339	.....	87	46,616
August	57	192	0	0	249	.....	68	44,132
September	44	172	0	0	216	.....	64	40,623
October	59	152	1	1	211	.62	66	38,416
November	48	133	0	0	181	.....	58	37,172
December	48	100	0	0	148	.....	49	36,224
Total	759	2,124	1	2	2,884	.07	65	44,329



REPORT

OF THE

DEPARTMENT OF HEALTH

OF THE

PANAMA CANAL

FOR THE

YEAR 1915

CHAS. F. MASON

Lieut. Colonel, Medical Corps, United States Army
Chief Health Officer, Balboa Heights, Canal Zone

WASHINGTON
1916

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UNITED STATES OF AMERICA
GOVERNMENT PRINTING OFFICE

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LETTER OF TRANSMITTAL.

DEPARTMENT OF HEALTH,
Balboa Heights, Canal Zone, January 25, 1916.

Lieut. Col. JAY J. MORROW,
Acting Governor of the Panama Canal,
Balboa Heights, Canal Zone.

SIR: I have the honor to submit the following report of the operations of the department of health for the calendar year 1915.

Very respectfully,

CHAS. F. MASON,
Chief Health Officer.

GENERAL REMARKS.

One case of smallpox was removed from the Panama Railroad steamer *Panama* on February 10. The disease was contracted prior to arrival on the Isthmus. Four cases of yellow fever were brought to Balboa quarantine from Buenaventura, Colombia; the first on September 27, the second on October 25, and the last two cases on December 10. Three of the cases proved fatal. These cases illustrate the necessity of very watchful quarantine against Colombian ports, as up to the time of arrival of the first case in quarantine the existence of yellow fever in Colombia had been officially denied. With these exceptions no cases of quarantinable disease originated on or were brought to the Isthmus during the year.

Ten cases of typhoid fever were, however, brought to the Canal Zone by ships arriving at its ports.

The shifting of population from the Canal Zone toward the Pacific end of the canal has continued during the year. A census of the zone by the police department taken as of July 10, 1915, showed the population of the zone to be 29,926—a decrease of 1,554 since the beginning of the year. Of the total population, 15,498 were living in the Balboa district.

The census of the cities of Panama and Colon by the health department was completed in the latter part of December, showing an increase in the city of Panama of about 500 and a decrease in the population of Colon of 4,638. The strength of the military at the end of the year was 7,682.

Corozal was abandoned as a Panama Canal town and turned over to the military at the close of the year.

The free treatment of physical defects found in school children at the annual physical examinations has been productive of good results.

The annual physical examination of male gold employees was made for the second time in November and December of this year,

and the results obtained indicate that it is well worthy of continuation. Of 3,548 employees examined, over 18 per cent showed some obvious physical defect which required treatment or advice in order to prevent physical degeneration or disease.

Instruction in regard to mosquito-borne diseases has been made a part of the course in the white public schools in the fifth, sixth, seventh, and eighth grades. The course is exciting a good deal of interest among the school children, who will assist in educating their parents on the matter.

The great fire in Colon, April 30, rendered homeless a large part of the population, a great many of whom were cared for in box cars and tents, the number being gradually reduced until the camp was closed in November, 1915.

During the year the new sanitary rules for the rat-proof construction of buildings and stables in the Canal Zone were adopted and, together with the old building regulations, published in convenient pamphlet form.

Laws and executive orders relating to health matters in the Canal Zone and the ordinances of the board of health were also compiled, published, and distributed in the form of a small booklet.

The Sanitary Rules and Regulations for the cities of Panama and Colon were carefully revised, elaborated, and brought up to date, and, after approval by you, were, in July last, submitted to the Panama Government for publication. Though action by that Government has been repeatedly urged, nothing has been done up to the present time. In the cities of Panama and Colon we have theoretically, according to the Taft agreement and our treaty, complete sanitary jurisdiction; but practically our work is limited to the results obtained from the amount of money contributed by the United States, and even these results are limited by the total lack of cooperation on the part of the Panama authorities in the city of Panama. On account of the close proximity of this city to the Canal Zone and its intimate relation to the welfare of the zone this condition of affairs has given me much anxiety, and may at any time become a serious menace to the successful operation of the canal. More than half of our silver employees live in Panama and are therefore directly affected by insanitary conditions there, which, under the present conditions, we can not control.

During the year 16,792 persons were vaccinated against smallpox in the cities of Panama, Colon, and the Canal Zone. In addition to this 16,325 persons were vaccinated on board vessels arriving and departing for foreign ports.

VITAL STATISTICS.

Employees.

The health of our employees in 1915 was better than in any previous year and the death rate lower.

The total admission rate to hospitals and quarters was 320.20, as compared with 401.54 for 1914 and 519 for 1913. For disease alone the admission rates to hospitals were 143.82 in 1915, 182.57

in 1914, and 246.91 in 1913. This is a net reduction of 42 per cent since 1913.

The total admission rate to hospitals only was 186.17, compared with 244.49 for 1914 and 351.10 for 1913.

The total death rate was 5.77, as against 7.04 in 1914 and 8.35 in 1913.

The constantly noneffective rate for the year, all causes, was 10.28, as compared with 12.22 for 1914 and 15.97 for 1913—a net reduction of 36 per cent since 1913.

Stated in another way, these figures mean that had our various rates remained the same in 1915 as for 1913 we would have had 6,915 more admissions, 90 more deaths, and 72,243 more sick days than we did have.

It is hard to estimate the actual saving in money, but the following figures will give an idea of what it is, taking the average pay of a white employee as $150 per month, and the cost of his treatment in hospital $1.82 per day, and the average pay of a black employee as $30 per month and his hospital treatment at $0.87 per day.

The saving in days lost by white employees in hospital, 25,061 days, at $5 in salary and $1.83 for hospital treatment, equals $171,166.63. Black employees in hospital, 27,984 days at $1 per day salary and $0.78 per day for hospital treatment, equals $49,811.52, or a total saving of $220,978.15.

With regard to malaria, which is our principal cause of disability, the admission rate, hospital, and quarters, was 51.20 as compared with 81.52 in 1914—a reduction of 37 per cent from the latter year. The death rate was 0.23 in 1915, 0.16 in 1914, and 0.37 in 1913—a net reduction of 38 per cent since 1913. Two whites and six blacks died of this disease; 1.19 employees per thousand were constantly sick with malaria in 1915.

In my opinion, all the permanent towns for employees in the Canal Zone are now practically free of endemic malaria, except Cristobal, Colon, and Gatun, and these towns will be free of it when the improvements planned are completed. It should be clearly understood, however, that these conditions obtain only in sanitated areas, and that exposure outside these areas will always involve danger of malaria; also, that the immunity at present enjoyed in sanitated areas will continue only as long as the present maintenance work is kept up.

There have been three cases of hemoglobinuric fever with one death during the year. There were 4 cases in 1914 and 19 cases and 6 deaths in 1913.

The admission rate for dysentery was: Amoebic, 0.14; bacillary, 0.06; clinical, 0.55. The corresponding rates for 1914 were 0.38, 0.18, and 1.24, and for 1913, 0.39, 0.07, and 1.61, a reduction of 64 per cent since 1913.

There were 4 admissions for liver abscess and 1 death from the same disease, as compared with 8 admissions and 4 deaths in 1914, and 14 admissions and 4 deaths in 1913.

Two cases of beriberi occurred during the year.

The admission rate for typhoid fever was 0.11 as compared with 0.52 in 1914 and 0.67 in 1913—a reduction of 84 per cent since the

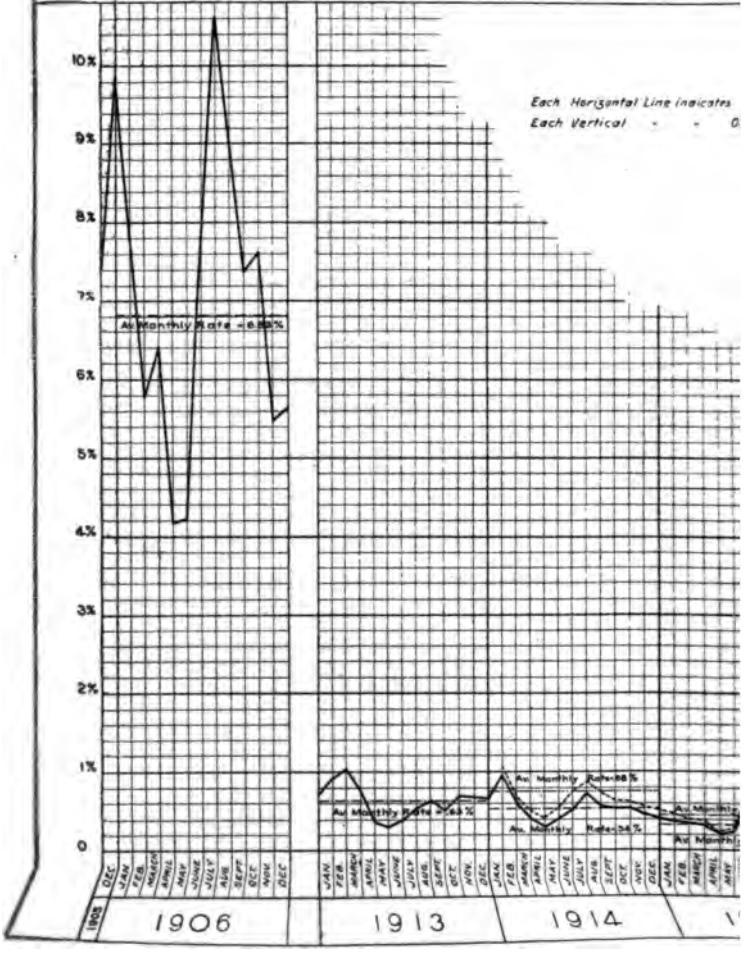
MALARIA CHART

FOR 1906, 1913, 1914 AND 1915

Showing the number of hospital MALARIA cases each month among emplo
and total cases for 1914 and 1915

Expressed as a percentage of the entire working force

——— Shows Hospital cases ---------- Shows Total cases



latter year. Of the total cases of typhoid fever, for employees and nonemployees, only 71 per cent were contracted on the Isthmus. There were 4 deaths from typhoid fever in 1913 among employees, as compared with 2 in 1915 and 4 in 1914.

There were 3 cases of dengue and none of relapsing fever during the year.

The five diseases causing the highest number of hospital admissions, with their rates, were as follows:

	Admissions.	Rate.
Malaria	1,570	45.13
Venereal diseases	580	16.67
Mumps	231	6.64
Tuberculosis	125	3.59
Influenza	97	2.79

All these diseases show a decided decrease over previous years, except tuberculosis and mumps, which show a slight increase.

The five diseases causing the highest number of deaths, with their rates, were as follows:

	Deaths.	Rate.
Tuberculosis	27	0.77
Pneumonia	25	.72
Nephritis	11	.31
Heart, organic disease of	10	.29
Malaria	8	.23

These death rates, except for malaria, are much lower than for any previous year; the rate for malaria is also much lower than for any year except 1914.

Effects of Season.

The highest death rates for disease occurred in the months of October and November and the lowest in April and May. The highest admission rates for disease were in June and July and the lowest in March and April.

Effects of Race.

The admission rate to hospitals and death rate for disease for black employees were 153.26 and 4.19 per thousand as compared with 395.85 and 3.18 from disease for white employees. The noneffective rate for disease and injuries for black employees per thousand was 8.78, as compared with 19.81 for white employees.

The admission rate to hospitals and quarters for malaria was 39.08 for blacks, as compared with 128.42 for white employees.

The admission rate to hospitals for disease and the death rate for disease for Americans were 267.97 and 2.63, while the admission rate for malaria to hospitals and quarters was 73.32.

Deportations.

The number of deportations was 109, divided as follows: Employees, 68; nonemployees, 41; disease, 91; and injury, 18. This is a large falling off since the previous year, when there were 176. The principal causes of deportation were as follows: Insane, 39; tuberculosis, 23; syphilis, 12; circulatory system, 4; and paralysis, 3.

Canal Zone.

With an average population of 31,946 in the Canal Zone there were a total of 410 deaths during the year. Of these, 361 deaths were from disease, giving a rate of 11.30 per thousand, as compared with 13.24 for 1914 and 14.43 for 1913. This is the lowest rate ever reached.

The birth rate for the year was 19.06. The infant mortality for white children under 1 year of age was 55 per thousand and for colored children 298, with a general average of 225. Of the total deaths from disease the percentage under 5 years of age was 51.

Considering also the 31 per cent reduction in the death rate of employees, it will be noted that the reduction in the death rate in each instance is in exact proportion to the degree of sanitary control which we exercise. In the case of employees the control is practically complete. In the Canal Zone it is restricted only by limitation in funds. In the case of nonemployees in Colon it is more complete than in Panama, for the reason that most of the land is owned by the Panama Railroad and that there is a greater willingness to cooperate on the part of the local authorities.

Panama City.

The average population of the city for the year was 60,373, among whom there were a total of 1,810 deaths. Of these, 1,749 deaths were from disease, giving a rate of 28.97 per thousand, as compared with 32.85 for 1914 and 30.21 for 1913. This is the lowest rate recorded for the city except in the year 1909.

The birth rate for the year was 51.03. The infant mortality was 221. Of the total deaths from disease the percentage under 5 years of age was 54.

Colon.

The average number of inhabitants for the year was 29,331, among whom there were 640 deaths. Of these, 604 were from disease, giving a rate of 20.59 per thousand, as compared with 24.20 for 1914 and 22.74 for 1913. This is the lowest rate ever recorded.

The birth rate for the year was 26.97. The infant mortality was 234.

Of the total deaths from disease, the percentage under 5 years of age was 45.

Ancon Hospital.

PERMANENT BUILDINGS.

The remaining bodies having been removed from the hospital cemetery and the site turned over to the building division on which to erect additional quarters, the crematory apparatus was dismantled and building demolished. A new concrete crematory building was erected near the eye and ear wards, the proposed site for the permanent laboratory, and at the end of the year was practically completed and ready for use.

The property storehouse of the hospital was consolidated with the medical storehouse of the health department in a permanent concrete building immediately adjacent to track facilities at the lower end of the hospital reservation.

Wards Nos. 3 and 4 were vacated and demolished in August and construction of the first unit of the permanent hospital was immediately commenced by the building division.

A fireproof room was built in the medical storehouse to provide for the protection of case histories and hospital cards against fire.

HOSPITAL BUILDINGS TRANSFERRED TO OTHER DIVISIONS.

When the insane were moved to Corozal all the asylum buildings were turned over to the supply department for remodeling into married quarters.

March 1 the district quartermaster took over control and maintenance and repair of all buildings excepting those actually used for the hospital proper.

The library building was vacated and turned over to the building division.

ROADS.

In April the main hospital road, now being more or less of a general thoroughfare between Ancon-Panama and Balboa Heights, was turned over to the municipal engineering division for future maintenance at the expense of that division.

X-RAY CLINIC.

Recent advances in roentgenology and radiotherapy has rendered it necessary to provide increased and better facilities for conducting work of this character.

During the past year the X-ray department has moved into larger and more suitable quarters, and the latest model equipment has been provided and installed for making modern radiographic examinations. The new equipment includes one vertical Roentgenoscope; one radiographic, stereoscopic, and fluoroscopic tube stand; one radiostereoscopic X-ray table with horizontal fluoroscopic attachments; one stereoscope; two Cooledge X-ray tubes with overhead wiring systems; a complete dark-room equipment, including a large soapstone developing tank with water cooling

apparatus for the rapid development of plates under tropical conditions.

To accommodate this apparatus and to provide the needed space for its satisfactory and economical operation, five rooms have been set aside for the use of this department. This arrangement provides an office and demonstrating room, examination room, fluoroscopic room, dark room, and a dressing room for patients.

In view of the great increase in the amount of X-ray work at Ancon Hospital, and its extension into fields other than surgical, it has been deemed advisable to relieve the surgical clinic of the hospital from further responsibility for work of this nature. An independent department has been established, effective January 1, 1916, and designated the X-ray clinic. As chief of the clinic, an expert roentgenologist has been secured who will devote his entire time to this work.

STEWARD'S DEPARTMENT.

No new equipment was added during the year. All present equipment was kept in thorough state of repair and replaced where necessary. The steam line continued furnishing efficient service. The lagging was painted with tar, the one and only expense of maintenance during the year.

QUARTERMASTER'S DEPARTMENT.

The dairy herd was transferred to the new dairy at Corozal farm in March.

The poultry flock was transferred to Corozal farm in February.

The garden was discontinued in 1914. Fresh vegetables are now furnished by Corozal Hospital farm. The following fruits were gathered from Ancon Hospital grounds and were turned into the kitchen: 250 bunches of bananas, 350 papayas, 200 coconuts, 18,000 limes, 12,000 mangoes, 950 avocados, 6,000 guavas, 800 oranges.

Papayas and bananas, having been found to be the most profitable products in the past, over 100 papaya trees and 200 banana suckers were set out during the year, additional ground having been gained by demolishing six poultry houses. Over 1,400 banana plants and 200 papaya trees are now under cultivation.

MOTOR TRANSPORTATION.

Truck No. 1, put in service March 22, was operated 11,109 miles, at cost of $1,551.15 (including depreciation), replacing $2,605.50 worth of animal transportation—a net saving to the hospital of $1,054.35 on a capital expenditure of $1,705.64.

Motor hearse, put in operation September 27, has been run 981 miles on $198.67 operating expenses (including depreciation)—a net saving over animal transportation turned in of $130.33 on a capital expenditure of $627.50.

Truck No. 2 was put in service December 28. Operating expense, $13.65; mileage, 130. Animal transportation it replaces will be turned in in early part of new year.

GARBAGE COLLECTION AND POLICING OF GROUNDS.

All asylum and all nonhospital buildings were transferred to the quartermaster's department early in the year. At the same time the district quartermaster took charge of the collection of all garbage on the hospital reservation, the hospital being charged its prorata of the expense of this service.

The only policing now done by hospital employees is that around hospital buildings proper, balance being done by respective departments concerned. This also applies to care of lawns, gardens, plants, and hedges.

REPAIRS TO EQUIPMENT AND BUILDINGS.

March 1 the district quartermaster took over the maintenance and repair of all buildings except those actually used for the hospital proper.

The following are the more important improvements and alterations, in addition to the usual repairs to equipments and buildings, made during the year.

An ice box, capacity of twenty-four 300-pound blocks of ice, was built into the kitchen in January-February. Storage space is 12 by 6 by 6½ feet, entered through vestibule. Four hundred pounds is about daily average consumption of ice.

All buildings in the poultry yard were demolished except one, which has been made into quarters for the colored foreman for the purpose of additional protection against depredations upon the fruit trees.

The dairy and hog barns were wrecked by Corozal farm laborers under the direction of the hospital artisans. All material, fittings, etc., possible were saved and removed to Corozal for future use.

A garage made of iron roofing from the wrecked poultry houses was erected for housing the motor transportation put in service during the year.

On removal of the property storehouse, changes were made in the layout of the general office building resulting in more suitable and commodious quarters for the superintendent and his office force, the drug store, the library, the medical clinic, and the X-ray clinic. An additional approach and exits were made to the building.

Dry closets were built into each of the nurses' rooms in the nurses' quarters prior to the transfer of building to quartermaster's department.

The isolation annex was made thoroughly mosquito proof and a gravel path laid to the building.

The oven of the bake shop was relined with fire brick.

Extensive work was done in the medical storehouse, such as putting up shelves, installing a linen room, condemnation room, racks for chart room, dry closet for instruments, and poison locker.

A clothes chute was put into ward 15.

All shop work for health department was taken care of, as well as repairs on the ground at Pala Seco Leper Asylum and Corozal Hospital.

DISPENSARY.

No change has been made in the ambulance and hospital car services or manner of admitting line patients.

The clinic has increased to such proportions that an additional physician and male nurse have been detailed for duty there.

Herewith is a comparative statement showing report of patient days: 1910, 394,406; 1911, 424,416; 1912, 415,009; 1913, 423,251; 1914, 338,901; 1915, 268,945.

BOARD OF HEALTH LABORATORY.

The following is a summary of work of special interest undertaken by the laboratory staff during the last half of the calendar year 1915. A similar report was submitted covering the first half of the year in the fiscal report for 1914–15.

A beginning has been made of a systematic Wassermann survey of patients in hospital not suspected of syphilis, and although the number examined so far is too small to be of value, we have found nearly 20 per cent positive. During the past year the number of Wassermann examinations of blood serum and spinal fluid has increased threefold.

Observations have been made in the entomological division on the breeding places of the *Syrphidæ;* on the breeding of the larva of midges (*Chironomidæ*) in the Camacho region, where the larvæ, by their presence in the water supply of Cascadas and Empire, have been troublesome. Observations on the screw-worm fly (*Chrysomyia macellaris*) have been continued, and also observations on the biology and life history of the coconut-tree caterpillar, *Brassolis isthmia*. A complete report of this study has been presented before the Medical Association of the Isthmian Canal Zone, and will appear in the proceedings of that body.

Examination of blood from native horses has shown that murrina, a disease caused by *Trypanosoma hippicum*, has reappeared in Panama after an absence of about four years. At present it is reported from Pecora, Republic of Panama only.

At the Corozal farm balantidic dysentery has caused a moderate number of deaths among the swine.

A compilation of the histories of cases of neoplasms among negroes has shown that malignant tumors, particularly carcinomata, are relatively more frequent than is shown by the available literature on the subject.

An investigation of the breeding habits of *Mansonia titillans* and allied mosquitoes is progressing. The question is of some importance, since the larvæ do not come to the surface, but remain attached to the roots of plants and are therefore difficult to kill.

A fairly large collection of reptiles of the Canal Zone has been made and additions are frequently being made to it. Whenever possible the toxicity of the venom of each reptile is tested upon guinea pigs, and a report of this work will be rendered later.

A large series of cases of Bright's disease has been studied with reference to the etiology of the disease on the zone, with the result that malaria, dysentery, and to a lesser degree syphilis, have been

definitely shown to be the underlying causes. A full report will appear in the proceedings of the Medical Association of the Isthmian Canal Zone.

At the conclusion of the year an extended mosquito survey of the Isthmus was in progress. About 26,000 determinations are being made each month, and a definite idea of the numbers and seasonal variation of each species will soon be possible. Examinations of adult mosquitoes is supplemented by collections of larvæ which are bred out at the laboratory.

A partial sanitary survey was made of Pueblo Nuevo, a suburb of Panama, and the report sent to the chief health office in August.

A case of typhoid fever at Corozal Hospital was traced to a carrier among the other patients, and subsequent examinations have shown that the carrier state was probably temporary.

The occasional appearance of hog cholera has led to the immunization of all hogs at the farm at intervals of three months, and as a result the loss from this cause has been very small.

A large amount of smallpox vaccine has been prepared during the year and the only difficulty encountered has been due to the practical impossibility of keeping an active strain of virus on hand, due to the small output and infrequent batches of vaccine; and as a consequence frequent importations of fresh virus from the States have been necessary.

Plans for a new laboratory for the board of health have been prepared, which will allow adequate room and facilities for work of a varied character.

INSANE ASYLUM.

In April this branch of the hospital was transferred to Corozal, where remodeled quarters had been erected for their use, and was consolidated with the Corozal farm, the new institution being named "Corozal Hospital." Administrative supervision of the new institution remains with Ancon Hospital.

There were 274 patients remaining in the asylum on January 1, 1915. During the year the movement was as follows: 159 admissions, 124 discharges (including 60 deportations), and 41 deaths: leaving a total of 268 patients remaining at the end of the calendar year. These 268 patients were classified as follows: Employees of the Panama Canal, 15; Panama Railroad employees, 3; Panama Government pay cases, 184; other pay cases (including 8 soldiers), 15; Canal Zone charity, 52. Total males, 156; total females, 112.

On March 14 the entire male section, with the staff of nurses, attendants, etc., under the direction of an assistant physician, was removed to the new hospital at Corozal. The final transfer of the institution from Ancon to Corozal was accomplished on April 9, when the female section was removed to the new site.

The new hospital is built on the pavilion plan with covered approaches. The wards are of the two-story type, well lighted and ventilated. Within the inclosure are 10 buildings, five each for the male and female patients, exclusive of the building for the laundry and sewing room, and the building for the kitchen and general mess rooms. The grounds are more spacious than the former location at Ancon, and afford a better opportunity for the

more comfortable patients to be out and assist in the care of the grounds.

The remainder of the site is occupied by the office, storerooms, quarters for the employees, and quarters for the farm cripples, who assist in the work of the garden, dairy, piggery, and poultry yard.

A consolidation of the Corozal Hospital for the Insane and the Hospital Farm for Disabled Employees was effected on September 1, in accordance with circular No. 625–2.

The sale of plants and flowers from the garden is increasing each month, and the demand is far greater than the supply. All vegetables and fruits are sold to Ancon Hospital and the local buyer for the commissaries. The revenue from the garden for the six months ending December 31, 1915, amounted to $1,363.55.

The milk production during the latter part of the year far exceeded the requirements of Ancon Hospital, the principal consumer, and the sale of milk to individuals was correspondingly increased. The total milk production during the last half of the calendar year was 46,336 quarts. The total revenue from the dairy during the period was $6,992.67. There were 74 cows and 21 calves in the herd at the close of the year.

There were 334 chickens in the poultry yard at the beginning of the year, to which were added 530 chickens from the Ancon Hospital flock in February. These were all old chickens, and for economical reasons a gradual reduction was made during the year by sales, until at the end of the year but 144 remained of the original flocks. During September and October 500 young chickens were received from the United States, and it is expected that the egg production will shortly be sufficient to supply all demands. The total revenue from the poultry yard during the past six months was $786.55.

The revenue from the piggery during the six months ending December 31 was $711.27. Number of pigs and hogs on hand 168.

CHRONIC WARD.

At the close of the year there were 26 chronic and incurable patients under treatment. The cost per patient, per day, was $0.25. Detailed statistics are shown in Table XVIII.

COLON HOSPITAL.

The construction of the new hospital began on June 11. The building, which is of reinforced concrete, was 80 per cent completed on December 31, and occupies the site of former buildings 17 and 19, which were razed for the purpose. It is expected that it will be ready for occupancy about April 1.

The consolidation of the Cristobal dispensary with the hospital during the fall of the preceding year necessitated an increase in the hospital staff of one physician, one druggist, one female nurse, and two attendants. A decrease of two male nurses was authorized during the same period.

The work done at this hospital is largely emergency in character. Contrasted with the 2,115 admissions to the hospital, there were

transferred from the hospital and dispensary to Ancon Hospital and Santo Tomas Hospital, during the year, 2,775 cases of a non-emergency character.

The following is a statistical summary:

Cases admitted to hospital	2,115
Major surgical operations performed	230
Minor surgical operations performed	610
Obstetrical cases delivered	47
Deaths in hospital	75
Cases transferred to Ancon Hospital	423
Cases transferred to Santo Tomas Hospital	179
Dispensary cases treated	55,786
Dispensary cases transferred to Ancon Hospital	1,839
Dispensary cases transferred to Santo Tomas Hospital	334
Physicians on duty, hospital and dispensary	5
Nurses on duty, hospital and dispensary	6
Attendants on duty, hospital and dispensary	25
Minor operations performed in dispensary	1,560
Prescriptions filled in pharmacy	51,746

Detailed statistics are shown in Table XIX.

Palo Seco Leper Asylum.

There has been marked improvement during the year in conditions affecting the comfort of the patients. Much of the work incident to these improvements has been done, in whole or in part, by the patients themselves, who have shown much interest in their home and have cooperated in its improvement. This attitude of mind on the part of the patients has contributed greatly to their contentment.

On the completion of the building for patients' quarters, reported last year, a new building was erected, entirely by labor of patients. It contains three rooms, which are used as superintendent's office, the dispensary, and the commissary.

Friends interested in the welfare of the asylum have contributed many things conducive to the comfort and amusement of the patients. Notable among these is a moving-picture machine. The gentlemen supplying all reels for use with these machines in this territory furnish reels for use at Palo Seco without charge. During the year five entertainments were given the patients by talent furnished by the Y. M. C. A. and by soldiers from the Tenth Infantry.

It became necessary to provide a congregating place for the patients in which entertainments could be given. It was decided to enlarge and remodel the building used as a dining room, to make it adaptable for these purposes. To do this it was necessary to move the schoolhouse from its former site near the end of the dining room to the edge of the beach. The dining-room building was then extended sufficiently to give ample room for use as an entertainment hall when desired. The space under the dining room was graded, given a concrete floor, and inclosed for use as a general recreation and congregating room for the patients. It is screened in, furnished with small tables, and supplied with games and a small library of books in English, Spanish, and French, and with magazines and daily papers. All of the buildings at Palo Seco, except two, were painted [redacted] necessary repairs.

Electricity was introduced into the reservation during the year by extending the line from the channel light near Farfan Beach. This has added greatly to the comfort of the patients, and to their safety by reducing the risk from fire. It has also proved a great economy in that it furnishes the power for pumping water into the supply tanks, which were formerly filled by the operation of a steam-driven pump.

Arrangements have been made by which it will soon be practicable to establish telephone communication between the asylum and Balboa, which will greatly facilitate the transaction of business.

The matter of systematic treatment has been left largely at the option of the patients. About July 1 all of them had abandoned continued treatment of any kind, and the belief was general among them that all proposed remedial measures caused them discomfort to a greater or less degree, without any appreciable benefit accruing therefrom.

During the last half of the year they have been encouraged to take chaulmoogra oil in as large doses as they have found that they could tolerate without much discomfort, and improvement was so marked in some cases which first began the use of the oil that the number volunteering to take it has gradually increased until at the present time approximately two-thirds of the patients are taking the oil regularly, and accurate records of its administration are being kept. It is too early to make a definite report as to what improvement, if any, may be accredited to the use of the oil at this time.

Detailed statistics are shown in Table XX.

Santo Tomas Hospital.

The number of patients in this hospital has continued to increase until it is now much overcrowded, and in addition many deserving patients have to be turned away. Under these conditions it has been impossible to provide adequate segregation of contagious diseases.

The tuberculosis ward has overflowed into other wards, the occupants of which are thereby exposed to the danger of infection; and many advanced tuberculosis cases which should be segregated in the hospital have been refused admission, for lack of beds to place them in. The remedy for this condition is in the hands of the Panama Government, which should build a separate hospital for tuberculosis patients, leaving the space now occupied by them in Santo Tomas Hospital for the reception of other acute cases.

Notwithstanding the large increase of work in this hospital, it has been efficiently done, and reflects credit upon the present superintendent and his staff.

Detailed statistics are shown in Table XXI.

District Dispensaries.

The number of line dispensaries has been reduced from 9 at the close of 1914 to 5 at the close of 1915, and 1 of these does not require the presence of a physician.

The stations having the highest admission rates for malaria were Gatun and Corozal, with an average weekly percentage of 0.37 and 0.27, and the lowest, Ancon and Balboa, with 0.08 each.

Detailed statistics are shown in Table IX.

SANITATION—CANAL ZONE.

The year began with six sanitary inspection districts in the zone, exclusive of the terminal cities, and ended with four, the Culebra district having been merged with the Pedro Miguel district, and that portion of the Corozal district not occupied by the Army having been attached to the Ancon district.

The sanitary work in the zone and the expense incident thereto were constantly assuming a more satisfactory status, due to the fact that permanent improvements are now possible where previously the work and the expenditure incident thereto were largely for temporary measures to meet transient conditions incident to construction work. This change, however, has not progressed as rapidly as was anticipated, and it has been necessary to continue the occupation of quarters and to maintain communities which it was hoped would be abandoned by this time. In some districts the continued occupation of unscreened quarters which it had been intended to destroy has resulted in an increased malaria rate for those localities. This factor in the maintenance of the sick rate is being eliminated as rapidly as possible by providing for screening of all quarters, and by the gradual reduction of the force of employees, and by the provision of new quarters owned and controlled by the Panama Canal.

The chief items in the expense of zone sanitation are those incident to cutting grass by scythes and machettes, the cleaning and grading of drainage ditches, and the oiling of low areas and of pools of water. Reduction of this maintenance expense is being accomplished as rapidly as funds will permit by sufficiently grading areas which require grass cutting to enable a mowing machine to do the work, by concreting ditches, and by underdraining seepage areas and pools wherever practicable.

Measures for the elimination of rats from the zone have been continued in all districts and compliance with the building regulations promulgated last year is constantly diminishing the number of structures which can harbor rats. The great importance of rendering it impossible for plague to obtain a foothold on the zone renders it highly desirable that the rat-proofing of all buildings be accomplished as early as possible.

The total cost of the division in 1915 was $145,421.54, as compared with $172,941.50 in 1914.

Detailed statistics are shown in Table XXIV.

SANITATION—PANAMA.

During the past year there has been a very considerable increase in the area covered by this work, as there has been a great deal of new building in the western part of the city around Ancon Avenue and Fourth of July Avenue, and there has also been a

consistent and steady growth of the city toward Bella Vista, in the Savannas. Many new buildings have been erected along Calidonia Road, as well as farther out, and the bulk of our work is now done in that part of the city. Approximately 35 per cent of the population of the city now resides east of the Calidonia bridge.

TUBERCULOSIS, PULMONARY AND OTHER FORMS.

This disease has always been prevalent in Panama in various forms, and under present conditions there is little hope of its eradication. Some interest is now being displayed in the matter by the Panaman authorities, and it is hoped that before another year is over some definite organized antitubercular work can be undertaken.

One of the greatest reasons for its prevalence at present is the overcrowding in rooms. This is a matter of education and economics. There is much unemployment in the city, and the West Indian and Panaman negroes and morenos, the class of people most subject to infection, are crowded in small rooms, anywhere from two to six being the average per room. These rooms are hermetically sealed at night, doors and windows being closed tight, owing to the characteristic negro dread of "night air." It will take a long course of educational endeavor along this line to cure this particular feature.

Patients contracting the disease rarely have it recognized sufficiently early to benefit by any treatment that can be given them, and by the time they apply to the hospitals for treatment are usually in the last stages of the disease. Several cases have been reported recently of patients dying in coaches or ambulances from tuberculosis while en route to the hospital, indicating their slowness in seeking relief. When they do apply for treatment in the earlier stages of the disease the diagnosis is frequently made of bronchitis, etc., and very rarely has this office known of a patient in Panama being treated for pulmonary tuberculosis in its incipient stage.

The matter of instituting a Government tuberculosis sanitarium by the Panaman Government has been under discussion for some time past, but so far nothing definite has been done. There are many favorable sites for such an institution in the hills in the interior of the Republic, and it is to be hoped that something definite in that line will be done soon. The total number of deaths from all forms of tuberculosis was 219, giving a rate of 365 per 100,000. This exceeds the rate for colored population of our larger southern cities.

TYPHOID FEVER.

During the year 18 cases of typhoid fever were reported, with 5 deaths, 4 of the cases being clinical, leaving 14 cases bacteriologically confirmed. All of the deaths occurred during the last six months of the year; two were in cases diagnosed clinically, thus giving an actual death rate of five for 100,000 population.

During February, 1915, three cases were reported from one block in Guachapali, which indicated the presence of a carrier,

but after the closing of an open sewer and an active campaign against flies in that neighborhood no further cases were reported.

The low typhoid death rate during the year 1915, as well as the past years, may be ascribed principally to the requirements of the sanitary rules that every building in the city shall be connected with sewer and public water supply. There are practically no exceptions to this rule, as nearly every inhabited street or district has full water and sewer connections. In the few cases where pit closets have been allowed, constant supervision is exercised to keep them fly and mosquito proof.

DIPTHERIA.

There were 18 positive cases of diphtheria reported, not including many suspects, who were proved negative on bacteriological examination. Four cases terminated fatally, giving a death rate for the year from this disease of 6 per 100,000.

MEASLES.

During the early part of the year a rather heavy epidemic of measles occurred, nearly all of the cases being of a mild type, however. The total cases were as follows:

Month.	Cases.	Month.	Cases.
January	3	August	241
February	19	September	26
March	61	October	6
April	49	November	3
May	20	December	2
June	24		
July	56	Total	510

There were eight deaths from broncho-pneumonia, with measles named as the contributory cause. This gives a rate of 13.33 per 100,000.

MALARIA.

At no time during the past year has the weekly hospital admission rate exceeded the very low figure of 0.04, and of late it has been 0.01 per cent. This is a great reduction over previous years. The number of canal and railroad employees living in the city will approximate nearly 25 per cent of the population. The great majority of these are West Indian negroes living in unscreened houses. All employees suffering from malaria are admitted to Ancon Hospital for treatment, and "clinical" diagnoses are accepted from that institution.

During the months of October, November, and December, 1915, to week ending January 11, out of the approximately 15,000 employees living in Panama in unscreened houses, there were only six cases of malaria admitted to Ancon Hospital. During the same months of 1914 there were 192 cases. This is the worst part of the rainy season ordinarily, and the average rainfall during those months was as follows: 1914—October, 6.44 inches; November,

10.35 inches; December, 8.28 inches. 1915—October, 10.49 inches; November, 7.05 inches; December, 3.59 inches.

Experience has shown that the average rate of mosquito breeding under normal conditions almost exactly follows the average rate of rainfall.

In connection with antimalaria work this office has installed, and oils and maintains, a system of earth ditches, totaling 152,867 feet in length, or approximately 29 miles. This is of course, a source of constant expense to the department, but it pays for itself in the reduced malaria rate throughout the city.

Below is given a table showing the number of hospital cases of malaria, with percentages, during the year 1914 as compared with 1915:

Population 50,000			Population 60,000.		
Month.	Total hospital cases.	Weekly percentage.	Month.	Total hospital cases.	Weekly percentage.
1914.			1915.		
January	319	0.13	January	127	0.04
February	111	.06	February	67	.03
March	123	.06	March	68	.03
April	107	.05	April	57	.03
May	104	.08	May	50	.02
June	137	.07	June	50	.02
July	179	.03	July	71	.02
August	274	.11	August	36	.02
September	168	.07	September	21	.01
October	254	.09	October	19	.01
November	167	.07	November	20	.01
December	121	.05	December	28	.01

There will always be some cases of malaria in the city of Panama on account of the number of infected districts just beyond the limits of the areas covered by our work, such as the Savannas, Juan Diaz, Old Panama, etc.

For instance, during the month of December, 1915, at the request of the Panaman Government, the health officer and the official physician of the State of Panama made a joint inspection of the village of Juan Diaz, about 10 miles east of the city. A number of native houses were inspected, malaria being found in practically every house in the village. Mosquito breeding was rampant, and a number of deaths from fever had been reported. Nothing can be done to control such a source as this without a sanitary inspector being stationed there constantly, with full equipment, material, and laborers, for some time at least. Medical visits would be necessary at least daily for several weeks if not months.

At the time of this visit, quinine and tonics were distributed, and recommendations made to the village authorities regarding drainage, brush cutting, etc. A return visit a few days later showed some improvement in the condition of the sick, and that some attempt had been made at improving the living conditions there; but the mosquitoes, and consequently, the malaria can not

be completely eliminated unless such work is done systematically under the direction of the health department.

The conditions found at Juan Diaz exist even closer in, and there are always to be found infected mosquitoes within striking distance of the city.

At old Panama, a resort much frequented at night, there is a constant focus of infection. Anopheles mosquitoes breed there in large numbers, no preventive work of any kind being carried out.

Owing to the proximity of such places as these, where no work is done, and where a certain percentage of the people of Panama go from time to time, it is a practical impossibility to stamp the disease out completely in the city without extending our campaign miles beyond the city proper in every direction. The public can not be restrained from going to an infected zone, which is less than 2 miles from the heart of the city, therefore these people contribute more or less constantly to the prevalence of malaria, their infections occurring outside of the city proper.

The deaths reported from malaria during the year 1915 were as follows:

January	4	August	6
February	1	September	1
March	7	October	1
April	3	November	1
May	1	December	1
June	1		
July	1	Total	28

This gives a rate of 46 per 100,000 population.

WHOOPING COUGH.

During the year only 14 cases of whooping cough were reported to this office. There is no doubt that many other cases occurred in the city among children receiving no treatment, and also unreported.

SCARLET FEVER.

During 1915 there were no cases of scarlet fever reported to or discovered by this office, the last case reported occurring in November, 1914.

EPIDEMIC AT TABOGA.

In the month of July, 1915, an outbreak of contagious disease at Taboga was reported. Investigation showed that the report was caused by the presence of eight cases of measles in the village, all of a mild type.

VACCINATION.

The general vaccination of the population of the city, which was begun in 1914, was completed in August of this year. A total of 23,244 vaccinations were done.

Several of the public schools were checked over after the work was concluded and it was found that the number of successful vaccinations aggregated 93.6 per cent of the total number made in children. The percentage of successful "takes" in adults is somewhat lower, as is natural.

General Sanitation.

MOSQUITO WORK.

The usual preventive work against mosquito breeding carried on consists of scrupulous search for containers in all the houses, patios, alleys, etc., in the city by the district inspectors on their weekly rounds, which are so calculated as to permit of them visiting every building in their respective districts at least once each week. By "containers" are meant tin cans, pieces of bottles, broken crockery, or any article which will catch and hold water the requisite time to allow mosquitoes to breed in same. In addition to search for containers, the routine work consists of drainage of all wet or swampy areas, cutting of grass and brush; oiling of water-soaked surfaces by sprayer, oil-soaked waste, or any other method deemed advisable. A very important measure is the impounding of all cattle caught straying on wet or marshy places, as their hoof prints form ideal receptacles in which mosquito breeding can occur, and when hidden in grass or brush are almost impossible of detection.

A large sum was expended during the year both by this division and by the Panama Land & Development Co., the owners of the Bella Vista property, in antimosquito work. Approximately 15,000 feet of ditches were installed by that company. At present it is not uncommon to spend an entire evening at Bella Vista without encountering a single mosquito.

During the month of September, 1915, the area of jungle between the city proper and the Curundu River, amounting to approximately 1,742,400 square feet, was cut and as much of it as possible will be burned over during the present dry season. The cutting of this brush revealed a large number of hidden breeding places. These were oiled or drained and a marked diminution of mosquitoes was observed shortly thereafter.

The list below shows the number of mosquito-breeding places found by the inspectors during their routine inspections during the year, the number of stegomyia being shown separately:

Month.	Breeding places found.	
	Stegomyia.	Total mosquito.
January	91	406
February	78	227
March	28	191
April	45	267
May	33	239
June	121	310
July	143	393
August	40	194
September	64	215
October	106	315
November	131	413
December	148	301
Total	1,028	3,471

These deposits of larvæ were destroyed. It would seem that the labors of 10 years should completely eradicate mosquitoes from the city proper. Such has not been the case. A source of mosquito influx has been found to be the railroad trains and street cars. During the month of December an examination was made of the incoming passenger trains at the Panama station, and it was found that they were at times heavily infested with mosquitoes, especially the train arriving from Colon about 7.00 p. m. As a result of the observations made at this first examination, an examination was made of an afternoon train just before leaving Colon, and observers on the train watched for the entrance of mosquitoes along the line. No mosquitoes were detected in the cars prior to departure from Colon. The first observed, entered the train at New Frijoles station; a larger number at the meeting point near Darien, where the train had to wait some few minutes for the one coming from the opposite direction; and others were observed entering at Gamboa and New Culebra. The numbers of mosquitoes in trains depends on the number of stops and length of time of such stops.

An examination was also made on the street cars running into the city at night from points beyond Bella Vista. While on the cars mosquitoes were seen entering them at points outside of which mosquito work has been carried on, some of the mosquitoes remaining in the cars until after they had reached the city. Later an examination was made of cars in the car barn near the center of the city and anopheles mosquitoes were found in the cars there.

Chiriqui prison, as is known to those familiar with the city, is situated at the extreme point of the promontory on which the city proper is built. In the prison yard are certain wet grassy patches which, from time to time, present anopheles breeding. From whence does the female mosquito come that deposits her eggs in this part of the city? There is no active anopheles breeding nearer than the Curundu River on the north and the Bella Vista limits on the east, each point being nearly 2 miles from the prison yard, but the fact remains that constant watchfulness is necessary to prevent anopheles breeding at that particular point.

These are factors which make complete eradication of mosquito breeding in Panama city almost unattainable. Lack of interest and cooperation on the part of ignorant natives is another feature that makes absolute success in this work almost an impossibility.

An active campaign was instituted against the few roof gutters which had been allowed to remain on buildings. Many of them contained mosquito breeding, and, with a very few exceptions, only in cases where actual damage to property from rain water would ensue were they allowed to remain on the houses.

RAT WORK.

Steady progress has been made in the rat proofing of houses all through the city, and especially so in the down-town districts along the water front and in the older part of the city, where there are many rock-mortar buildings, a good proportion of which have been standing for many years. Attention was given to the detailed work of sealing openings around pipes with cement, also openings in

walls, sidewalks, etc. This was particularly effective at the public market.

A table is given of the number of rats trapped by the district inspectors in the course of their daily routine inspections:

Month.	Rats caught.	Month.	Rats caught.
January	1,159	August	610
February	797	September	472
March	951	October	634
April	719	November	428
May	587	December	511
June	591		
July	687	Total	8,146

All rats caught were examined for plague, but none were found infected.

FLY WORK.

The trapping of flies and work for the prevention of fly breeding have been followed out very closely, and favorable results have been observed. The removal of the stables, to a large extent, from the central part of the city eliminated great numbers of fly-breeding places, and constant supervision is exercised over those remaining, reducing that nuisance to a minimum.

The total number of flies trapped during the year amounted to 414 quarts, the estimated number of flies per quart being 13,000, which makes the total catch approximately 5,382,000 flies. The greater part of this fly trapping was done at the public dump and to some extent also at markets and food stores.

The number of fly-breeding places discovered and eliminated by the inspectors during their routine work was as follows:

Month.	Breeding places found.	Month.	Breeding places found.
January	302	August	130
February	264	September	139
March	307	October	125
April	304	November	80
May	277	December	119
June	200		
July	188	Total	2,435

STABLES.

The opening of the new Panama Railroad stables on the Huerta-Sandoval tract on B Street, between the Amador and Chinese cemeteries, on October 11, 1915, was a public improvement, the effect of which was felt almost immediately. Within a very few days every stall was taken and a waiting list was compiled. At

present there are 248 stalls, all of them occupied, and it is hoped that more will be constructed.

These stables were one of the most important sanitary measures accomplished during the past year. Great attention was paid to making them rat proof in every respect, the foundation extending 2 feet down into the ground, and great care exercised in permitting no openings anywhere that would afford hiding or nesting places for rats. The grain used at the stables is kept in bins, which are considered rat proof also; and the protection afforded to the public by segregating these stables and maintaining them rat and fly proof is of inestimable benefit.

The following table shows the work accomplished in the line of building construction during the year 1915:

	Permits issued.	Permits completed.	Buildings condemned.
New buildings	178	176	.....
Condemned buildings	41	118	.....
Repairs	706	650	.....
Number of buildings	.....	.....	90
Demolished by—			
House occupants	.....	.....	16
Owners	.....	.....	53

FOOD INSPECTION.

During the entire year the inspection of hotels, restaurants, clubs, bakeries, bottling works, dairies, milk venders, etc., has been under the charge of an inspector assigned to that duty especially. During the early part of the year records were not kept of the work to any extent, but in the last few months close attention has been paid to recording this work, and a statement is given below showing what has been accomplished since August 23, 1915. Record has been kept of number of inspections made of bottling works, dairies, hotels, restaurants, clubs, and bakeries since July, 1915.

Months.	Dairies, milk venders, etc.	Bakeries, candy kitchens, etc.	Bottling works.	Hotels, clubs, and restaurants.	Miscellaneous.
July [1]	.....	.....	.....	.....	.....
August	1	.....	.....	66	43
September	43	42	32	5	136
October	126	8	1	4	60
November	73	21	2	5	74
December	105	29	3	96	57
Total	348	100	38	176	370

[1] Inspector on duty with Colon Health Office the entire month (from Aug. 23 to 31, inclusive).

A continual effort is being made to improve the quality of the milk in the city, and it is believed that our efforts in that direction are having some beneficial effect. Periodic examinations are made of the milk sold in the city, and regular inspections of the dairies are made.

Four of the dairies have been forced to close up, as they were hopelessly insanitary in their surroundings and methods, and three others have been forced to remove their plants to better surroundings.

STREET CLEANING AND GARBAGE SERVICE.

There has been no change in the system of street cleaning and garbage handling, it having been found from experience that the present system is the most efficient one possible with the force at our disposal.

On account of the growth of the city, arrangements must be made for an increase in the garbage-service force. At Bella Vista, which is growing rapidly, no garbage service has been instituted, and the need for one is rapidly becoming very urgent, but as yet this office has no facilities for extending this work to include that district.

Some considerable mosquito breeding was noticed at the dump during the past rainy season, which was discovered to be due to the large numbers of cans, etc., piled up and accumulating water. This was promptly stopped, and all cans are now cut or flattened with hammer or hatchet, until they can not hold water before being piled up at the dump.

During the year 840 garbage cans were sold to various house owners in the city, most of them being either for new buildings or to replace worn-out cans in service.

Detailed statistics are shown in Table XXIV.

SANITATION—COLON.

The most gratifying fact about the work of the office has been the reduction of the malaria rate to a minimum. The year closed with the rate touching zero several times in close succession and without one anopheles breeding place found on Manzanillo Island for several months.

THE COLON FIRE.

Our work during the year was heavily affected by the great fire of April 30, which destroyed 22 blocks of the city, about one-third of the whole place, including much of the most populous part of the city, and rendered temporarily homeless about 5,000 people. This added to the previous congestion of the houses, besides necessitating caring for some 2,000 in cars and tents. This office, in conjunction with that of the municipal engineer, had to install immediately a water, sewer, and garbage service for these refugee camps—a work which was completed in a week after the fire. We also had to police these premises and to watch the occupants carefully for any cases of infectious disease.

There was a heavy increase in the number of flies for a short time, due to masses of half-burned foodstuff under débris in inaccessible places. This was removed and destroyed as rapidly as possible, and adult flies were killed by larvacide spray throughout the city, soon eliminating them. At present the fly nuisance is reduced to a very low point.

The fire greatly increased the work of the building inspector, as rebuilding operations commenced very quickly. A decree of President Porras enjoined rebuilding with fireproof materials only. Most of the new construction has been concrete.

Street cleaning was also largely augmented.

The necessity of preventing stegomyia breeding in the numerous containers in the burned area, both after the fire and during the reconstruction, added largely to the work of the mosquito gangs.

There were no epidemics or serious outbreaks of disease of any kind. The refugee camps were all eliminated by December 1, the people finding quarters in New Gatun and in new houses erected in Colon. Much praise is due the officers, both of the line and of the Medical Corps, of the United States Army for their cooperation in handling the situation created by the great conflagation.

General Sanitation.

A change has been made in the methods of inspection by which the whole city was divided into four sections, and each section put in charge of an inspector whose duties covered all classes of health work, except those of street cleaning, garbage removal, and building construction. The inspectors in charge have each a gang who destroy mosquito and fly larvæ; remove rubbish and garbage from premises and place it for the wagons; inspect every building and all yards, premises, parks, and open spaces; examine all closets, sinks, and sewer traps; and clean the beaches. Each inspector also inspects especially all docks, piers, shops, markets, bakeries, ice-cream parlors, bottling works, slaughterhouses and other industrial establishments, stables, and vegetable gardens. He serves notices against nuisances and reports cases for penalty, and attends court, if necessary, to secure convictions. He is furnished with a badge for identification. A special detail of a policeman with the inspector was secured, with beneficial results.

The inspectors took a census of the city in the month of November.

They assist the health officer in following up reports from the hospitals and physicians to locate cases of communicable disease and to establish quarantine connection where indicated. One is specially charged with the work of disinfection and fumigation. They also contribute to popular education in public health, incidentally to their other work, which carries them constantly into the homes of the people and brings them into close and frequent personal relationship with them. It is hoped to extend and increase this phase of the work in the coming year.

MOSQUITO, RAT, AND FLY WORK.

In order to decrease the amount of oiling a number of new ditches were dug in the area south of the wireless station in Colon and east of the Panama Railroad stables. The expedient was tried of piling the earth taken out of the ditches in mounds instead of throwing it alongside of the ditches, thereby allowing the surface water to run off into the ditches between the mounds. Formerly this water was retained by the elevated bank along the ditches and often did not drain into them at all. These measures as well as energetic and careful inspection and oiling completely eliminated all anopheles mosquito breeding on Manzanillo Islands for the past five months.

Mosquito catching was carried on in the silver barracks at Camp Bierd, in the tents and cars along Broadway, and other quarters and buildings, when deemed wise. It was found that *Culex fatigans* bred freely in the large D Street storm sewer canal when it was recently chocked. This also applies to the catch basins on the streets, which required oiling and cleaning periodically.

A number of old gutters were removed, some tanks and other containers eliminated, and rigid work against *Aedes calopus*. Twenty-five shacks on the extreme southeastern edge of the island were condemned and burned because of the persistent keeping of *Aedes calopus* containers there. It was found that the small coastwise trading schooners were bringing *Aedes calopus* to this port in their water vessels. This matter was taken up with the quarantine office for action and for permanent relief.

The antiplague work has progressed to the point when rat infestation is at a low point. There are only three buildings left which do not comply with the regulations about floors and foundation walls, and these are of people whose means are limited and to whom we have given more time. In a short time there will not be any such buildings in Colon.

SCHOOLS.

The examination of the schools for communicable diseases has been periodically carried out. There has been no epidemic or outbreak of infectious disease, and the health of the pupils has been good.

BUILDINGS.

An enormous improvement in housing conditions will result from the construction of the new concrete buildings in the burned area. At the same time, improvements in the old buildings have been required.

STREET CLEANING.

This work has also been much heavier this year, due to the after-effects of the fire and the large rebuilding operations. There has been a special campaign to remove collections of rubbish in some places, such as on the beaches, around the old piers, on the edges of the hydraulic fills. The result has been a notable improve-

ment in the general appearance of many parts of the city and reduction of culex breeding and rat infestation.

GARBAGE REMOVAL.

This work has increased considerably. A modification of the standard stand for the garbage cans in use here for several years has been made by using a concrete base and metal cover. This is much more easily kept clean and is more durable. The system of incinerating garbage by open fires has many disadvantages, and the matter of installing a more modern system demands consideration.

SIDEWALKS AND VACANT LOTS.

A vigorous prosecution of the work of repairing sidewalks was initiated early in the summer. A large number of places were reconcreted. Many vacant lots and patios were filled and regraded; some of them were completely concreted. Upon our recommendation the Panama Railroad is now requiring all owners of vacant lots to put in sidewalks, and is putting them on its own unleased lots. This work has eliminated many obstinate mosquito-breeding places, and also facilitated cleaning these places and reducing fly breeding.

PURE FOOD.

The shops, hotels, restaurants, bakeries, cafés, fruit stands, bottling works, ice-cream parlors, and all other establishments of the kind are inspected constantly. There have been no cases of disease traced to any of these sources during the year.

A better system of supply of fresh milk is badly needed here, as the dairies hitherto conducted are going entirely out of business.

STABLES.

Horses may now be kept in only three stables in the city—the quartermaster's department stables in Mount Hope, the Panama Railroad stables in Colon, and the Colon stables in East Colon. This regulation is of the utmost importance in minimizing fly and rat breeding.

The Panama Railroad stables underwent a thorough renovation this year, the stalls and yards being concreted and the premises made rat proof and easy to keep clean.

Colon stables have been greatly improved. One of them was condemned and torn down. Others were improved, concrete sidewalks put in, some of the stalls and alleys reconcreted. A concrete drainage system is now being put in and the vacant lots filled and graded. A concrete roadway was installed in the section, from G Street to the dump, where the traffic is exceptionally heavy. Rat-proof grain boxes are required, and all miscellaneous loose equipment must be hung up or placed on grated platforms high enough to be swept out beneath. A large water main was carried out to these stables.

All manure is required to be removed to the incinerating dump before 3 p. m. daily, and there it is destroyed at once, unless required for fertilizing purposes, when it is handled as below described.

HANDLING OF STABLE MANURE.

The demand for stable manure by the supply department and by several Chinese and other gardeners led to special efforts to facilitate this without allowing fly breeding. This problem has been solved by requiring the manure to be placed in fly-tight concrete tanks, built in two sections, one of which, when filled, must be kept for two weeks until the larvæ have bred out and died. All manure in excess of that required for these purposes is burned. There is practically no fly nuisance from this source now. Fresh manure is not permitted in the gardens and horses are not allowed to be kept where they will contribute to fly breeding.

Detailed statistics are shown in Table XXIV.

QUARANTINE DIVISION.

During the year 2,191 vessels were inspected at quarantine, as against 1,637 for the calendar year 1914—an increase of 554. The maximum number of ships received in any one month was 246, in July. The lowest number 98, in December, the marked decrease being accounted for by the closure of the canal.

During the year special attention has been paid to the rat proofing of chicken coops and vegetable and other food containers on board of vessels which are not equipped with cold storage and which carry food animals on the hoof and fowls and vegetables on deck for use as food. These vessels practically all trade with plague-infected ports along the South American coast, and the value of these measures is apparent.

Mechanical cleanliness upon all vessels arriving at the Canal Zone ports has also been given special attention and the proper disposal of garbage has been insisted upon. The vessels above referred to, carrying cattle and other food animals on the hoof, have had in the past large accumulation of refuse around the lower decks and around the cattle and sheep pens particularly. Cleanliness of these vessels has been made obligatory, and one flagrant violation in this respect was taken to court and the master fined.

In order to maintain our local regulations regarding mechanical cleanliness, the disposal of garbage, breasting off, the application of proper rat guards, etc., a daily water-front inspection has been inaugurated and maintained at both terminals of the canal and in Colon.

At Cristobal and Colon also, where a number of small sail vessels engaged in coastwise traffic arrive, inspections are being made to determine whether water containers on board are breeding mosquitoes and to eliminate such breeding places by appropriate measures of screening, etc.

At the Colon quarantine station recommendations have been made to extend the reservation, with the idea of having a larger area in connection with the scheme for a permanent station.

At the Balboa quarantine station, the permanent site for the Pacific terminal of the canal, concrete sidewalks have been put in, trees and hedges planted, and a type 17, modified, cottage erected for use of the additional medical officer for this station. This cot-

tage was occupied early in December. The Balboa quarantine landing was also completed in November and it has since been in use. Quarantine passengers who were formerly debarked at Balboa and transferred from there to the quarantine station are now landed directly at the station from the quarantine pier.

During the latter part of July an inspection trip was made by the chief quarantine officer to the Colombian ports of Cartagena, Savanilla, Barranquilla, and Santa Marta. The special object of this inspection was for the purpose of investigating the high and unusual mortality reported from these places, but in addition much general information bearing on the subject of quarantine was obtained and made the subject of a special report.

During September and October a quarantine inspection by the chief quarantine officer was made along the west coast of South America, embracing the coast ports of Ecuador, Peru, and Chile, in all 37 ports being visited.

On December 27 the quarantine officer of Cristobal-Colon departed on an inspection trip to the San Blas coast of the Republic of Panama for the purpose of noting sanitary conditions along this coast, with special reference to traffic between here, particularly Port Obaldia and the Colombian coast.

One case of smallpox occurred on the steamship *Panama*, which arrived at Cristobal February 3, 1915. One case of smallpox, practically recovered, arrived in April at Balboa on the steamship *Newport*. This case very likely originated in some Mexican port.

Four cases of yellow fever have been received at Balboa quarantine on the following dates: One case arrived September 26, one case arrived October 25, two cases arrived December 10. All of the above cases came from Buenaventura, Colombia, and all arrived by the steamship *Jamaica*.

A valuable commentary upon the necessity of maintaining a protective quarantine against our neighboring Central American ports is shown in the arrival of the first yellow fever case from Buenaventura, no previous knowledge of the existence of yellow fever in this port being had by us until the arrival of this case, and no bill of health or other notation from the authorities that yellow fever was present at the port of departure of this ship. On December 10, when the two last cases were received, the bill of health from Buenaventura noted no yellow fever cases present at that time.

No diseases of a quarantinable nature have originated on the Isthmus during the calendar year. Statistical reports are herewith appended. (See Table XXV.)

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TABLE I.—ADMISSIONS, DEATHS, AND NONEFFECTIVE RATES I EMPLOYEES: DEATHS OF RESIDENTS OF PANAMA, COLON, A THE CANAL ZONE.

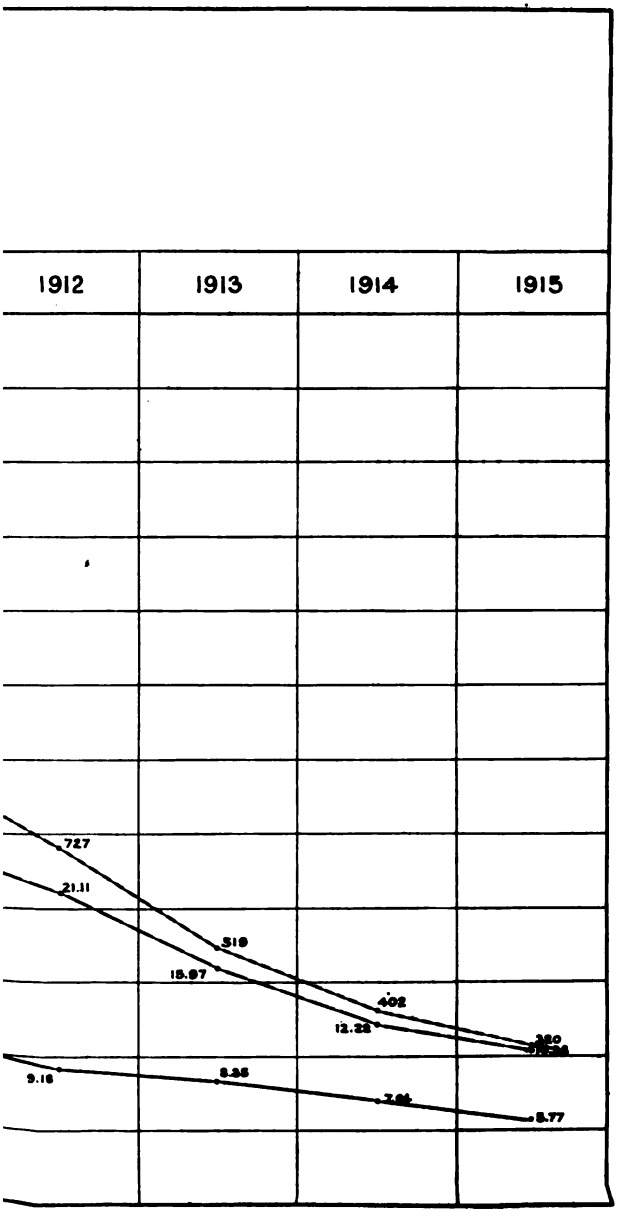
ABSOLUTE NUMBERS.

Color.	Average number of employees.	Admissions to hospitals.			Deaths.			Noneffec from sick
		Total.	Disease.	External causes.	Total.	Disease.	External causes.	Days treated.
Year 1915:								
White	4,719	1,868	1,572	296	26	15	11	34,123
Colored	30,066	4,608	3,431	1,177	175	126	49	96,400
Total	34,785	6,476	5,003	1,473	201	141	60	130,523
Year 1914:								
White	7,024	3,678	3,028	650	47	22	25	59,480
Colored	37,305	7,160	5,065	2,095	265	173	92	138,350
Total	44,329	10,838	8,093	2,745	312	195	117	197,830

PROPORTIONATE NUMBERS.[1]

Year 1915:								
White	4,719	395.85	333.12	62.73	5.51	3.18	2.33	.....
Colored	30,066	153.26	114.11	39.15	5.82	4.19	1.63	.....
Total	34,785	186.17	143.82	42.35	5.77	4.05	1.72	.....
Year 1914:								
White	7,024	523.63	431.09	92.54	6.69	3.13	3.56	.....
Colored	37,305	191.93	135.78	56.15	7.10	4.63	2.47	.....
Total	44,329	244.49	182.57	61.92	7.04	4.40	2.64	.....

[1] Annual average per 1,000.


1912
1913
1914
1915
7.27
21.11
5.19
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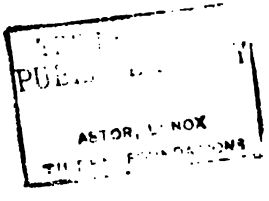
4.02
12.22
3.80
9.16
8.35
7.84
8.77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DEATHS OF RESIDENTS OF THE CITIES OF PANAMA, COLON, AND THE CANAL ZONE.

Place.	Population.	Deaths.			Annual average per 1,000.		
		Total.	Disease.	External causes.	Total.	Disease.	External causes.
Year 1915:							
Panama	60,373	1,810	1,749	61	29.98	28.97	1.01
Colon	29,331	640	604	36	21.82	20.59	1.23
Canal Zone	31,946	410	361	49	12.83	11.30	1.53
Total	121,650	2,860	2,714	146	23.51	22.31	1.20
Year 1914:							
Panama	53,948	1,863	1,772	91	34.53	32.85	1.68
Colon	23,265	590	563	27	25.36	24.20	1.16
Canal Zone	46,379	710	614	96	15.31	13.24	2.07
Total	123,592	3,163	2,949	214	25.59	23.86	1.73

TABLE II.—DEATHS BY AGE, COLOR, AND SEX.

Age.	White.			Colored.			Yellow.			Total.		
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.
Under 1 year	59	47	106	489	401	890	4	2	6	552	450	1,002
1 to 4 years	19	17	36	191	161	352	1	.....	1	211	178	389
5 to 10 years	2	4	6	25	23	48	.....	1	1	27	28	55
11 to 20 years	10	2	12	46	49	95	.....	.....	.....	56	51	107
21 to 30 years	25	15	40	259	149	408	4	.....	4	288	164	452
31 to 40 years	33	11	44	182	110	292	6	.....	6	221	121	342
41 to 50 years	23	8	31	124	74	198	5	.....	5	152	82	234
51 to 60 years	22	4	26	65	35	100	4	.....	4	91	39	130
61 to 70 years	7	5	12	34	22	56	.....	.....	.....	41	27	68
71 to 80 years	7	3	10	7	20	27	1	.....	1	15	23	38
81 to 90 years	5	3	8	4	8	12	.....	.....	.....	9	11	20
91 to 100 years	.....	1	1	.....	2	2	.....	.....	.....	.....	3	3
Unknown	3	.....	3	13	4	17	.....	.....	.....	16	4	20
Total	215	120	335	1,439	1,058	2,497	25	3	28	1,679	1,181	2,860

TABLE III.—DEATHS BY NATIONALITY.

Nations.	Employees.	Nonemployees.	Total.
Antigua	4	29	33
Australia	.....	1	1
Austria	.....	1	1
Bahama Islands	1	4	5
Barbados	48	364	412
Canada	1	2	3
Chile	.....	1	1
China	.....	27	27
Colombia	5	78	83
Costa Rica	.....	5	5
Cuba	.....	4	4
Curacao	1	3	4
Demerara	1	9	10
Denmark	1	1	2
Dominica	1	5	6
Ecuador	.....	8	8
England	.....	5	5
Fortune Islands	2	2	4
France	.....	10	10
Germany	.....	2	2
Greece	.....	5	5
Grenada	5	31	36
Guadeloupe	6	13	19
Guiana, British	1	3	4
Haiti	.....	3	3
Honduras	.....	1	1
India	3	1	4
Italy	.....	9	9
Jamaica	72	539	611
Japan	.....	3	3
Martinique	7	49	56
Mexico	.....	5	5
Montserrat	1	6	7
Nevis	1	3	4
Nicaragua	.....	6	6
Panama	9	1,203	1,212
Peru	.....	7	7
Porto Rico	.....	1	1
Portugal	.....	1	1
Persia	.....	1	1
Russia	.....	1	1
Salvador	.....	1	1
Scotland	.....	1	1
St. Domingo	.....	1	1
St. Kitts	1	5	6
St. Lucia	3	40	43
St. Thomas	1	6	7
St. Vincent	3	15	18
Spain	1	27	28
Sweden	.....	1	1
Trinidad	3	24	27
United States	18	55	73
Venezuela	.....	8	8
West Indies	1	3	4
Unknown	.....	20	20
Total	201	2,659	2,860

TABLE IV.—CAUSES OF DEATHS OF EMPLOYEES OF THE PANAMA CANAL AND PANAMA RAILROAD.

Causes of death.	White.	Colored.	Total.
Disease.			
Alcoholism, acute and chronic	2		2
Anemia		2	2
Aneurysm		5	5
Apoplexy	1	3	4
Asthma		1	1
Brain, softening of		2	2
Calculi of the urinary passages		1	1
Cancer of intestines	1		1
Cancer and other malignant tumors of stomach and liver		1	1
Cancer of organs not specified		1	1
Carbuncle	1		1
Cerebrospinal fever		1	1
Cerebral sclerosis		1	1
Dysentery, unclassified	1	1	2
Encephalitis		1	1
Endocarditis, acute and chronic		2	2
Fever, malarial, estivoautumnal	2	6	8
Fever, typhoid		2	2
Gastritis, acute		1	1
Heart, organic disease of	1	9	10
Hemoglobinuric fever, unqualified	1		1
Intestinal obstruction	1	1	2
Infective exhaustive psychosis		1	1
Kidneys, disease of		2	2
Liver, abscess of		1	1
Liver, cirrhosis of	1		1
Lungs, abscess of	1		1
Lungs, gangrene of		2	2
Meningitis, pneumococcus		1	1
Meningitis, tuberculous		3	3
Nephritis, acute		1	1
Nephritis, chronic		10	10
Peritonitis, simple		1	1
Pneumonia		2	2
Pneumonia, lobar	1	22	23
Pyelonephrosis		1	1
Senility	1		1
Septicemia		2	2
Septicemia, purulent infection and		2	2
Tetanus		3	3
Tuberculosis, abdominal		2	2
Tuberculosis, disseminated		11	11
Tuberculosis of the bones and joints		1	1
Tuberculosis, miliary		3	1
Tuberculosis, pulmonary		10	13
Ulcer, duodenal		1	0
Uretha, diseases of		1	1
Undiagnosed		2	2
Violence.			
Accidental traumatism, various	4	12	16
Drowning, accidental	5	18	23
Electric shock		2	2
Homicides		2	2
Railroad accidents	1	12	13
Suicides	1	2	3
Other external violence		1	1
Total	26	175	201

TABLE V.—DEATH RATES AMONG AMERICANS ON THE ISTHMUS.

	Cases.	Cause of death.	Number of deaths.	Annual average per 1,000.
Average number of white employees from the United States.	4,187	Disease	11	2.63
		External causes	7	1.67
		All causes	18	4.30
Average number of white women and children from the United States.	3,556	Disease	17	4.78
		External causes	.....	.....
		All causes	17	4.78
Average number of white employees and their families from the United States.	7,743	Disease	28	3.61
		External causes	7	.91
		All causes	35	4.52
Total number of Americans on the Canal Zone.[1]	13,861	Disease	34	2.45
		External causes	14	1.01
		All causes	48	3.46

[1] The figures representing the total number of Americans on the Canal Zone include employees and their families and the officers and men of the United States Army and their families stationed on the Isthmus.

TABLE VI.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOYEES AND NONEMPLOYEES) AND MILITARY AND PLACES WHERE CHARGEABLE.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
General diseases.				
1. Typhoid fever	5	2	.....	7
Malarial fever:				
4a. Estivoautumnal	22	7	24	53
4d. Mixed	.....	.....	1	1
4e. Undermined	1	.....	.....	1
4f. Clinical	3	.....	1	4
4h. Hemoglobinuric fever, malarial	2	1	.....	3
6. Measles	8	2	.....	10
8. Whooping cough	2	.....	2	4
9. Diphtheria and croup	4	3	.....	7
9a. Croup	.....	1	.....	1
9b. Diphtheria bacillus carrier	.....	1	.....	1
10. Influenza	1	.....	.....	1
14. Dysentery	11	2	.....	13
14c. Dysentery, unclassified	4	2	2	8
18. Erysipelas	1	.....	.....	1
19b. Chicken pox	.....	1	.....	1
19e. Hemoglobinuric fever, unqualified	.....	.....	1	1
19I. Yaws	1	.....	.....	1
20. Purulent infection and septicemia	2	3	1	6
20a. Pyemia	2	2	1	5
20b. Septicemia	10	2	.....	12
20c. Pyemia and septicemia, pneumococcic	2	.....	.....	2
24. Tetanus	7	3	1	11
26. Pellagra	33	10	3	46
27. Beriberi	1	1	.....	2
28. Tuberculosis of the lungs	210	60	14	284
29. Acute miliary tuberculosis	4	3	4	11
30. Tuberculous meningitis	10	4	1	15
31. Abdominal tuberculosis	2	1	4	7

TABLE VI.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOYEES AND NONEMPLOYEES) AND MILITARY AND PLACES WHERE CHARGEABLE—Continued.

	Diseases.	Panama.	Colon.	Canal Zone.	Total.
	General diseases—Continued.				
	Tuberculosis:				
33a.	Of bones and joints	1		1	2
34.	Of other organs	2			2
34d.	Of the genito-urinary organs	1			1
35.	Disseminated tuberculosis	15	6	10	31
36.	Rickets	1	4		5
	Syphilis:				
37A.	Primary	2			2
37C.	Tertiary	4	4	2	10
37D.	Hereditary	9	2		11
37E.	Period not stated	4			4
38A.	Gonococcus infection		1		1
38Aa.	Gonorrhea		1		1
38Ab.	Gonorrheal arthritis		1		1
	Cancer and other malignant tumors:				
39.	Of the buccal cavity	3			3
40.	Of the stomach and liver	3	1	2	6
41.	Of the peritoneum, intestines, rectum	2		1	3
42.	Of the female genital organs	11	2	2	15
43.	Of the breast	2	1		3
45.	Other organs and of organs not specified	4		1	5
46.	Other tumors (tumors of the female genital organs excepted)		1		1
47.	Acute articular rheumatism	1			1
50A.	Diabetes		1	2	3
53	Leuchemia	1			1
53a.	Leuchemia lymphatic	1			1
53b.	Hodgkin's disease	1			1
	Anemia:				
54.	Chlorosis		1		1
54b.	Primary, pernicious	1	1		2
54c.	Secondary, cause not determined	5	1		6
	Alcoholism:				
56.	Acute or chronic	4	1	1	6
56a.	Acute	8	2	2	12
56b.	Chronic	5	3	1	9
56c.	Alcoholic psychosis	3	1	1	5
59a.	Drug habit		1		1
	Diseases of the nervous system and of the organs of special sense.				
60.	Encephalitis	1		2	3
61.	Simple meningitis	10	2	2	14
61a.	Cerebrospinal fever	2			2
61b.	Pneumococcus meningitis	5		1	6
62.	Locomotor ataxia	1			1
63.	Other diseases of the spinal cord	2			2
63a.	Acute anterior poliomyelitis	1			1
64.	Cerebral hemorrhage, apoplexy	22	10	5	37
65.	Softening of the brain	3	2	1	6
66.	Paralysis without specified cause	3	2	1	6
67.	General paralysis of the insane	3		1	4
68.	Other forms of mental alienation	3			3
69.	Epilepsy	4	3	1	8

TABLE VI.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOYEES AND NONEMPLOYEES) AND MILITARY AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
Diseases of the nervous system and of the organs of special sense—Continued.				
70. Convulsions (nonpuerperal, 5 years and over)	2	.....	1	3
71. Convulsions of infants (under 5 years of age)	11	6	6	23
74. Other diseases of the nervous system	1	1	.....	2
74a. Tumor of the brain	4	.....	.....	4
76. Diseases of the ears	5	.....	1	6
Diseases of the circulatory system.				
77. Pericarditis	3	2	.....	5
78. Acute endocarditis	13	6	3	22
78a. Malignant endocarditis	2	1	1	4
79. Organic diseases of the heart	77	32	16	125
80. Angina pectoris	6	.....	.....	6
81a. Aneurysm	3	3	4	10
81b. Arteriosclerosis	20	1	3	24
82. Embolism and thrombosis	1	.....	.....	1
84. Diseases of the lymphatic system (lymphangitis, etc.)	1	.....	1	2
84a. Lymphadenitis (nonvenereal)	1	.....	.....	1
85. Hemorrhage; other diseases of the circulatory system	2	1	1	4
Diseases of the respiratory system.				
86b. Myiasis of nasal fossæ and sinuses	1	.....	1	2
89. Acute bronchitis	67	69	4	140
90. Chronic bronchitis	9	5	.....	14
91. Bronchopneumonia	129	24	28	181
92A. Pneumonia (unqualified)	47	4	1	52
92B. Lobar pneumonia	45	16	21	82
93A. Pleurisy	3	2	.....	5
93B. Empyema	1	.....	.....	1
94. Pulmonary congestion, pulmonary apoplexy	2	.....	.....	2
95. Gangrene of the lungs	2	1	3	6
96. Asthma	5	.....	1	6
97. Pulmonary emphysema	.....	2	.....	2
98. Other diseases of the respiratory system (tuberculosis excepted)	1	1	.....	2
98a. Abscess of lungs	.....	1	.....	1
Diseases of the digestive system.				
99b. Stomatitis	1	.....	.....	1
100. Diseases of the pharynx	1	.....	.....	1
101b. Stricture of the esophagus	1	.....	.....	1
103. Other diseases of the stomach (cancer excepted)	2	.....	.....	2
103b. Acute gastritis	10	5	.....	15
103c. Chronic gastritis	.....	8	.....	8
103d. Acute indigestion	4	1	2	7
104. Diarrhea and enteritis (under 2 years)	310	37	20	367
104a. Colitis	41	7	3	51
105. Diarrhea and enteritis (2 years and over)	9	4	1	14
105a. Colitis	7	3	.....	10
106. Ankylostomiasis	4	.....	.....	4

TABLE VI.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOYEES AND NONEMPLOYEES) AND MILITARY AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
Diseases of the digestive system—Continued.				
108. Appendicitis and typhlitis	2			2
108a. Acute appendicitis		1	1	2
109. Hernia, intestinal obstructions	4	1	2	7
109a. Inguinal hernia	1			1
109b. Other hernias	1			1
109c. Intestinal obstruction	5	1	3	9
110. Other diseases of the intestines	2	1	1	4
110a. Constipation			1	1
110b. Duodenal ulcer	1	1		2
113. Cirrhosis of the liver	7	5		12
114. Biliary calculi	1		1	2
115. Other diseases of the liver		1		1
115a. Abscess of the liver (unqualified)	10	5	1	16
115b. Abscess of the liver (entamebic)			1	1
116. Diseases of the spleen	1			1
117. Simple peritonitis (nonpuerperal)	10	6	1	17
118. Other diseases of the digestive system (cancer and tuberculosis excepted)		1		1
Nonvenereal diseases of the genito-urinary system and annexa.				
119. Acute nephritis	28	9	5	42
120. Bright's disease (chronic nephritis)	65	57	15	137
122. Other diseases of the kidney and annexa	8	2	4	14
122c. Pyelonephrosis	3	1	1	5
123. Calculi of the urinary passages	1	1		2
124a. Cystitis	1	1		2
125. Diseases of the urethra, urinary abscess, etc	1	1		2
125a. Stricture of the urethra, (nonvenereal)	1			1
128. Uterine hemorrhage (nonpuerperal)	1			1
129. Uterine tumor (noncancerous)	1			1
130. Other diseases of the uterus	2		1	3
132. Salpingitis and other diseases of the female genital organs	2	1		3
The puerperal state.				
134B. Accidents of pregnancy	1	1	1	3
134Bb. Hyperemesis gravidarum	2			2
134Bc. Abortion	1		1	2
135. Puerperal hemorrhage		2	2	4
136. Other accidents of labor	1			1
137. Puerperal septicemia	5	1	2	8
138. Puerperal albuminuria and convulsions		1	1	2
138a. Eclampsia	2	3	3	8
140. Following childbirth (not otherwise defined)			1	1
Diseases of the skin and of the cellular tissue.				
142. Gangrene	4	1		5
143. Furuncle	1			1
143a. Carbuncle			1	1
144. Acute abscess	1			1
144a. Phlegmon and cellulitis	1			1
145E. Pemphigus contagiosus	2			2
145O. Tropical ulcer	1			1
145T. Other diseases of the skin and annexa	1		1	2

TABLE VI.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOYEES AND NONEMPLOYEES) AND MILITARY AND PLACES WHERE CHARGEABLE—Continued

Diseases.	Panama.	Colon.	Canal Zone.	Total.
Diseases of the bones and of the organs of locomotion.				
146b. Mastoid abscess	1			1
146c. Osteomyelitis			1	1
147. Diseases of the joints (tuberculosis and rheumatism excepted)		1		1
Malformations.				
150. Congenital malformations (stillbirth not included)	6		2	8
Diseases of early infancy.				
151A. Newborn child	1		6	7
151B. Congenital debility, icterus, and sclerema	7	3	3	13
151Ba. Premature birth	33	12	13	58
151Bb. Congenital debility	28	10	14	52
151Bd. Malnutrition	66	38	35	139
152. Other causes peculiar to early infancy (including various consequences of labor)	12	5		17
153. Lack of care		1		1
Old age.				
154. Senility	7	4	1	12
Affections produced by external causes.				
155. Suicide: By poisoning	4	3		7
157. Suicide: By hanging or strangulation		1	1	2
159. Suicide: By firearms	5	3	1	9
163. Other suicides			1	1
164. Poisoning by food	1		1	2
165. Other acute poisoning	3			3
166. Conflagration		4		4
167. Burns (conflagration excepted)	3		3	6
168. Absorption of deleterious gases (conflagration excepted)	1			1
169. Accidental drowning	5	8	23	36
Traumatism:				
170. By firearms	1	1	1	3
172. By fall	6	3	4	13
174. By machines	4	1	2	7
175. By other crushings (vehicles, railroads, landslides, etc.)	2	3	4	9
175a. Railroad traumatism	4	4	4	12
177. Starvation	1			1
181. Electricity (lightning excepted)		2	1	3
Homicide:				
182. By firearms	4	1	1	6
183. By cutting or piercing instruments		1	1	2
184. By other means	1			1
185A. Fractures (causes not specified)	2	1		3
186. Other external violence	14		1	15
Ill-defined diseases.				
187. Illdefined organic disease	1		3	4
188. Sudden death	1	2		3
189A. Cause of death not specified or ill-defined	45	13	7	65
189Aa. Infections of undetermined origin	3	1	3	7
Total	1,810	640	410	2,860
Stillbirths	178	63	58	299
Grand total	1,988	703	468	3,159

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES AND SOLDIERS IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES.

Diseases.	Employees.				Soldiers.	
	Admissions.		Deaths.		Admissions.	Deaths.
	White.	Black.	White.	Black.		
General diseases.						
1. Typhoid fever		4		2		
Malarial fever:						
4a. Estivoautumnal	211	627	2	6	162	
4b. Tertian	75	146			70	
4c. Quartan	1	9				
4e. Undetermined	1					
4f. Clinical	136	359			76	
4g. Cachexia	1	1				
4h. Hemoglobinuric fever, malarial	3				1	
6. Measles	1	60			7	
7. Scarlet fever		1				
9. Diphtheria and croup	7	10				
10. Influenza	35	62			33	
13. Cholera nostras					2	
14. Dysentery	4	3	1			
14a. Entamebic	1	4			3	
14b. Bacillary		2			1	
14c. Unclassified		12		1		
17. Leprosy		2				
18. Erysipelas	6	1			1	
19A. Dengue	3				1	
19B. Chicken pox		5			1	
19C. German measles					1	
19D. Mumps	16	215			35	
19E. Hemoglobinuric fever, unqualified	1	2	1			
19I. Yaws	1					
19J. Kala-azar	1					
19K. Filariasis		2				
19L. Malta fever		1				
19M. Acute infectious jaundice (Weil's disease)	2	2			4	
20. Purulent infection and septicemia	2	1		4		
20b. Septicemia	1					
20c. Pyemia and septicemia, pneumococcic					1	
24. Tetanus		3		3		
26. Pellagra		6				
27. Beriberi		2				
28. Tuberculosis of the lungs	19	85		9	3	1
29. Acute miliary tuberculosis		6		3		
30. Tuberculous meningitis		3		3		
31. Abdominal tuberculosis		4		2		
33a. Tuberculosis of bones and joints		3		1	1	
34c. Tuberculosis of the lymph glands		1			2	

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES AND SOLDIERS IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES—Continued.

	Diseases.	Employees.				Soldiers.	
		Admissions.		Deaths.		Admissions.	Deaths.
		White.	Black.	White.	Black.		
	General diseases—Continued.						
34e.	Tuberculous abscess		1				
35.	Disseminated tuberculosis		3		12		
	Syphilis:						
37A.	Primary	5	10			10	
37B.	Secondary	16	47			44	
37C.	Tertiary	6	136			14	
37D.	Hereditary		2				
37E.	Period not stated	5	21			9	
38A.	Gonococcus infection	5	11			4	
38Aa.	Gonorrhea	33	90			125	
38Ab.	Gonorrheal arthritis	1	11			4	
38Ac	Gonorrheal bubo	1	6			9	
38Ad.	Gonorrheal orchitis and epididymitis	10	30			18	
38Ae.	Gonorrheal ophthalmia		8				
38B.	Soft chancre	13	70			64	
38Ba.	Adenitis chancroidal	6	37			47	
	Cancer and other malignant tumors:						
39.	Of the buccal cavity					2	
40.	Of the stomach and liver	3	1		1		
41.	Of the peritoneum, intestines, rectum	1					
44.	Of the skin		2			2	
45.	Of other organs and of organs not specified		5		1		
46.	Other tumors (tumors of the female genital organs excepted)	1	6			9	
47.	Acute articular rheumatism	4	13			5	
48.	Chronic rheumatism and gout	6	22			6	
50A.	Diabetes	1	3				
53b.	Hodgkin's disease		3				
54c.	Anemia, secondary, cause not determined	1	3		2		
55.	Other general diseases	8	9			4	
55a.	Serum disease		1				
55b.	Purpura hemorrhagica	1	1				
	Alcoholism:						
56.	Acute or chronic	2				3	
56a.	Acute	12		1		30	
56b.	Chronic	2		1		3	
56c.	Alcoholic psychosis	1	1			4	
59a.	Drug habit					1	

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES AND SOLDIERS IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES—Continued.

Diseases.	Employees.				Soldiers.	
	Admissions.		Deaths.		Admissions.	Deaths.
	White.	Black.	White.	Black.		
Diseases of the nervous system and of the organs of special sense.						
60. Encephalitis	.....	1	.....	1	.....	.....
61. Simple meningitis	.....	1	.....	2	2	1
61b. Pneumococcus meningitis	.....	1	.....	1	.....	.....
63. Other diseases of the spinal chord	1	.....	.....	.....	.....	.....
63a. Acute anterior poliomyelitis	.....	1	.....	.....	.....	.....
64. Cerebral hemorrhage, apoplexy	1	3	1	2	.....	.....
65. Softening of the brain	.....	3	.....	2	.....	.....
66. Paralysis without specified cause	1	5	.....	.....	2	.....
67. General paralysis of the insane	.....	.....	.....	.....	2	.....
68. Other forms of mental alienation	3	6	.....	1	12	.....
68a. Dementia precox	1	4	.....	.....	10	.....
69. Epilepsy	3	8	.....	.....	2	.....
70. Convulsions (nonpuerperal, 5 years and over)	.....	1	.....	.....	.....	.....
73A. Hysteria	1	1	.....	.....	4	.....
73B. Neuralgia	4	2	.....	.....	1	.....
73C. Neuritis	15	15	.....	.....	7	.....
74. Other diseases of the nervous system	3	4	.....	1	10	.....
74a. Tumor of the brain	.....	.....	.....	.....	1	.....
74b. Neurasthenia	14	2	.....	.....	18	.....
75. Diseases of the eyes and their annexa	50	133	.....	.....	55	.....
75a. Follicular conjunctivitis	.....	2	.....	.....	2	.....
75b. Trachoma	.....	.....	.....	.....	1	.....
76. Disease of the ears	26	22	.....	.....	64	.....
Diseases of the circulatory system.						
77. Pericarditis	.....	1	.....	.....	.....	.....
78. Acute endocarditis	1	1	.....	1	4	1
78a. Malignant endocarditis	.....	2	.....	2	.....	.....
79. Organic diseases of the heart	16	30	1	4	3	.....
81. Diseases of the arteries, atheroma, aneurysm, etc	.....	2	.....	.....	.....	.....
81a. Aneurysm	1	1	.....	3	.....	.....
81b. Arteriosclerosis	.....	2	.....	.....	.....	.....
82. Embolism and thrombosis	1	.....	.....	.....	.....	.....
83. Diseases of the veins (varices hemorrhoids, phlebitis, etc.)	8	4	.....	.....	10	.....

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES AND SOLDIERS IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES—Continued.

Diseases.	Employees.				Soldiers.	
	Admissions.		Deaths.		Admissions.	Deaths.
	White.	Black.	White.	Black.		
Diseases of the circulatory system—Continued.						
83a. Hemorrhoids	13	26	.....	.....	26	.....
83b. Varices	.....	2	.....	.....	1	.....
83c. Varicocele	3	2	.....	.....	13	.....
83d. Phlebitis	.....	2	.....	.....	.....	.....
81. Diseases of the lymphatic system (lymphangitis, etc.)	5	7	.....	.....	3	.....
84a. Lymphadenitis (nonvenereal)	17	42	.....	.....	44	.....
85. Hemorrhage; other diseases of the circulatory system	1	.....	.....	.....	1	.....
Diseases of the respiratory system.						
86. Diseases of the nasal fossæ	30	3	.....	.....	31	.....
87. Diseases of the larynx	.....	2	.....	.....	.....	.....
87a. Laryngitis	1	2	.....	.....	4	.....
88. Diseases of the thyroid body	.....	.....	.....	.....	2	.....
89. Acute bronchitis	39	53	.....	.....	23	.....
90. Chronic bronchitis	11	16	.....	.....	3	.....
91. Bronchopneumonia	.....	8	.....	.....	.....	.....
92A. Pneumonia (unqualified)	.....	12	.....	.....	.....	.....
92B. Lobar pneumonia	2	73	1	22	3	.....
93A. Pleurisy	12	60	.....	.....	5	.....
93B. Empyema	2	2	.....	.....	.....	.....
94. Pulmonary congestion, pulmonary apoplexy	.....	1	.....	.....	.....	.....
95. Gangrene of the lungs	.....	.....	1	2	.....	.....
96. Asthma	7	9	.....	1	.....	.....
97. Pulmonary emphysema	1	.....	.....	.....	.....	.....
98. Other diseases of the respiratory system (tuberculosis excepted)	4	.....	.....	.....	1	.....
98a. Abscess of lungs	1	1	.....	.....	.....	.....
98b. Hay fever	1	.....	.....	.....	.....	.....
Diseases of the digestive system.						
99. Diseases of the mouth and annexa	1	1	.....	.....	4	.....
99a. Diseases of the teeth and gums	9	7	.....	.....	3	.....
99b. Stomatitis	.....	1	.....	.....	1	.....
100. Diseases of the pharynx	11	12	.....	.....	26	.....
100a. Pharyngitis	2	4	.....	.....	1	.....

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES AND SOLDIERS IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES—Continued.

Diseases.	Employees.				Soldiers.	
	Admissions.		Deaths.		Admissions.	Deaths.
	White.	Black.	White.	Black.		
Diseases of the digestive system—Continued.						
100b. Follicular tonsilitis	45	30	.....	.....	79	.....
101. Diseases of the esophagus	1	.....	.....	.....	.....	.....
101a. Foreign body in the esophagus	1	1	.....	.....	.....	.....
102. Ulcer of the stomach	7	3	.....	.....	2	.....
103. Other diseases of the stomach (cancer excepted)	3	1	.....	.....	.....	.....
103b. Acute gastritis	7	3	.....	.....	.....	.....
103c. Chronic gastritis	3	2	.....	.....	1	.....
103d. Acute indigestion	4	11	.....	.....	3	.....
104a. Colitis	.....	2	.....	.....	2	.....
105. Diarrhea and enteritis (2 years and over)	13	29	.....	.....	18	.....
105a. Colitis	2	5	.....	.....	4	.....
106. Ankylostomiasis	.....	11	.....	.....	.....	.....
107. Intestinal parasites	2	9	.....	.....	.....	.....
107a. Ascariasis	.....	3	.....	.....	.....	.....
107b. Teniasis	.....	.....	.....	.....	1	.....
108. Appendicitis and typhlitis	.....	1	.....	.....	.....	.....
108a. Acute appendicitis	32	7	.....	.....	38	1
108b. Chronic appendicitis	20	7	.....	.....	17	.....
109. Hernia, intestinal obstructions	.....	.....	.....	.....	1	.....
109a. Inguinal hernia	42	80	.....	.....	30	.....
109b. Other hernias	2	1	.....	.....	4	.....
109c. Intestinal obstruction	.....	.....	1	.....	2	.....
110. Other diseases of the intestines	71	18	.....	.....	46	.....
110a. Constipation	15	12	.....	.....	9	.....
110b. Duodenal ulcer	2	3	.....	1	2	.....
110c. Sprue	1	.....	.....	.....	.....	.....
113. Cirrhosis of the liver	3	2	1	.....	1	.....
114. Biliary calculi	2	1	.....	.....	1	.....
115. Other diseases of the liver	10	2	.....	.....	5	.....
115a. Abscess of liver (unqualified)	1	2	.....	.....	.....	.....
115b. Abscess of the liver (entamoebic)	.....	1	.....	1	.....	.....
115c. Cholecystitis	10	2	.....	.....	.....	.....
117. Simple peritonitis (nonpuerperal)	2	.....	.....	.....	.....	.....
118. Other diseases of the digestive system (cancer and tuberculosis excepted)	.....	3	.....	.....	1	.....

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES AND SOLDIERS IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES—Continued.

Diseases.	Employees.				Soldiers.	
	Admissions.		Deaths.		Admissions.	Deaths.
	White.	Black.	White.	Black.		
Nonvenereal diseases of the genito-urinary system and annexa.						
119. Acute nephritis	5	5	.....	1	1	1
120. Bright's disease (chronic nephritis)	3	40	.....	10	2	.....
122. Other diseases of the kidney and annexa	3	5	.....	2	1	.....
122c. Pyelonephrosis	2	8	.....	1	2	.....
123. Calculi of the urinary passages	10	3	.....	1	5	.....
124. Diseases of the bladder	1	5	.....	.....	.....	.....
124a. Cystitis	10	4	.....	.....	3	.....
125. Diseases of the urethra, urinary abscess, etc.	6	14	.....	1	5	.....
125a. Stricture of the urethra, nonvenereal	1	18	.....	.....	4	.....
126. Diseases of the prostate	1	.....	.....	.....	.....	.....
126a. Acute prostatitis	.....	1	.....	.....	1	.....
126b. Chronic prostatitis	5	.....	.....	.....	1	.....
126c. Abscess of the prostate	.....	1	.....	.....	.....	.....
126d. Hypertrophy of prostate	2	.....	.....	.....	1	.....
127. Nonvenereal diseases of the male genital organs	13	60	.....	.....	5	.....
127a. Hematocele	.....	.....	.....	.....	1	.....
127b. Hydrocele	7	24	.....	.....	2	.....
127d. Lymph scrotum and varix	.....	1	.....	.....	.....	.....
128. Uterine hemorrhage (nonpuerperal)	2	.....	.....	.....	.....	.....
129. Uterine tumor (noncancerous)	1	.....	.....	.....	.....	.....
130. Other diseases of the uterus	5	1	.....	.....	.....	.....
130a. Metritis	1	.....	.....	.....	.....	.....
132. Salpingitis and other diseases of the female genital organs	.....	2	.....	.....	.....	.....
133. Nonpuerperal diseases of the breast (cancer excepted)	.....	2	.....	.....	.....	.....
The puerperal state.						
134Bc. Abortion	.....	2	.....	.....	.....	.....
135. Puerperal hemorrhage	1	.....	.....	.....	.....	.....
138. Puerperal albuminuria and convulsions	.....	.....	.....	.....	1	.....
140. Following childbirth (not otherwise defined)	.....	1	.....	.....	.....	.....

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES AND SOLDIERS IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES—Continued.

Diseases.	Employees.				Soldiers.	
	Admissions.		Deaths.		Admissions.	Deaths.
	White.	Black.	White.	Black.		
Diseases of the skin and of the cellular tissue.						
142. Gangrene		4			1	
143. Furuncle	7	5			4	
143a. Carbuncle	10	4	1		3	
44. Acute abscess	31	63			34	
144a. Phlegmon and cellulitis	18	24			12	
145B. Scabies		1				
145E. Pemphigus contagiosus		1			1	
145G. Ground itch		1				
145K. Dhobie itch	2	1			10	
145M. Ulcer of the skin	8	8			1	
145O. Tropical ulcer		2				
145Q. Impetigo contagiosa	3	1			1	
145R. Urticaria	1				1	
145S. Ingrowing nail	9	1			18	
145T. Other diseases of the skin and annexa	18	17			28	
Diseases of the bones and of the organs of locomotion.						
146. Diseases of the bones (tuberculosis excepted)	13	10			4	
146a. Caries (nontuberculous)		1				
146b. Mastoid abscess		4				
146c. Osteomyelitis	2	2			1	
146d. Periostitis	2	2			1	
147. Diseases of the joints (tuberculosis and rheumatism excepted)		2			1	
147a. Ankylosis		1				
147b. Arthritis	8	40			4	
147c. Synovitis	7	2			8	
148. Amputations	4	25			1	
149. Other diseases of the organs of locomotion	29	19			13	
Malformations.						
150. Congenital malformations (stillbirth not included)		1			7	
Old age.						
154. Senility	1		1			

TABLE VII.—ADMISSIONS AND DEATHS OF EMPLOYEES AND SOLDIERS IN THE HOSPITALS OF THE PANAMA CANAL, FROM ALL CAUSES—Continued.

Diseases.	Employees.				Soldiers.	
	Admissions.		Deaths.		Admissions.	Deaths.
	White.	Black.	White.	Black.		
Affections produced by external causes.						
Suicide:						
159. By firearms	1	.....	1	.....	.....	.....
160. By cutting or piercing instruments	1	.....	.....	.....	.....	.....
164. Poisoning by food	31	18	.....	.....	7	.....
165. Other acute poisonings	6	4	.....	.....	5	.....
165b. Snake bite	1	.....	.....	.....	.....	.....
166. Conflagration	.....	1	.....	.....	.....	.....
167. Burns (conflagration excepted)	7	29	.....	1	2	.....
168. Absorption of deleterious gases (conflagration excepted)	1	1	.....	.....	.....	.....
170. Traumatism by firearms	1	6	.....	.....	17	.....
171. Traumatism by cutting or piercing instruments	29	176	.....	.....	19	.....
172. Traumatism by fall	18	95	1	3	13	.....
173. Traumatism in mines and quarries	.....	14	.....	.....	.....	.....
174. Traumatism by machines	7	61	.....	2	1	.....
175. Traumatism by other crushings (vehicles, railroads, landslides, etc.)	19	180	.....	2	5	.....
175a. Railroad traumatism	.....	28	.....	3	2	.....
175b. Dynamite traumatism	.....	2	.....	.....	.....	.....
175c. Traumatism by landslides	.....	8	.....	1	.....	.....
176. Injuries by animals	.....	3	.....	.....	3	.....
179. Effects of heat	1	.....	.....	.....	2	.....
179b. Heat exhaustion	1	2	.....	.....	.....	.....
180. Lightning	.....	1	.....	.....	.....	.....
185A. Fractures (cause not specified)	26	88	.....	.....	29	.....
185B. Dislocations	5	10	.....	.....	7	.....
185C. Sprains	20	37	.....	.....	12	.....
186. Other external violence	120	412	.....	.....	70	.....
Ill-defined diseases.						
187. Ill-defined organic disease	6	3	.....	1	.....	.....
189A. Cause of death not specified or ill-defined	1	2	.....	2	.....	.....
189Aa. Infections of undetermined origin	11	22	.....	.....	3	.....
189Ba. No disease	4	11	.....	.....	15	.....
189Bb. Feigned disease	1	.....	.....	.....	2	.....
Total	1,866	4,708	16	128	1,897	5

TABLE VIII.—CONSOLIDATED HOSPITAL REPORT.

	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
ANCON HOSPITAL.												
Panama Canal employees	45	176	1,334	2,845	10	66	1,335	2,813	9	24	25	117
Panama Railroad employees	9	34	173	976	2	34	172	895	2	6	6	75
Panama pay patients	....	....	....	2	....	....	....	....	....	1	....	1
Other pay patients	147	45	3,500	1,126	41	118	3,472	996	23	9	111	48
Charity patients	16	40	267	429	9	58	259	356	2	15	13	41
Total	217	295	5,274	5,378	62	276	5,238	5,060	36	55	155	282
Insane department.												
Panama Canal employees	5	13	3	5	....	1	2	4	1	2	5	10
Panama Railroad employees	....	7	1	2	....	1	1	1	....	4	....	3
Panama pay patients	13	160	12	81	....	26	7	31	....	20	18	165
Other pay patients	6	2	29	8	1	2	23	2	1	1	9	5
Charity patients	10	58	1	18	....	5	2	8	1	19	8	45
Total	34	240	46	114	1	35	35	46	3	46	40	228
Grand total	251	535	5,320	5,492	63	311	5,273	5,106	39	101	195	510
Corozal farm.												
Panama Canal employees	8	35	5	25	....	....	3	14	....	....	11	45
Chronic ward.												
Charity patients	....	28	.....	29	....	....	.....	28	....	3	....	26
COLON HOSPITAL.												
Panama Canal employees	5	11	278	447	4	6	247	340	31	107	1	5
Panama Railroad employees	3	12	85	433	1	17	73	282	13	136	1	10
Panama pay patients	1	1	38	185	2	15	8	24	30	145	....	1
Other pay patients	8	1	359	167	5	8	289	117	61	37	11	5
Charity patients	1	....	42	95	3	5	29	55	8	36	3	1
Total	18	25	802	1,327	15	51	646	818	143	461	16	22
PALO SECO LEPER ASYLUM.												
Panama pay patients	2	31	1	7	....	2	.....	1	....	....	3	35
Charity patients	2	15	.....	3	....	....	.....	....	....	....	2	18
Total	4	46	1	10	....	2	.....	1	....	....	5	53

TABLE VIII.—CONSOLIDATED HOSPITAL REPORT—Continued.

	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
GRAND TOTALS.												
Panama Canal employees	63	235	1,620	3,322	14	73	1,587	3,171	41	133	4	177
Panama Railroad employees	12	53	259	1,411	3	52	246	1,178	15	146	7	88
Panama pay patients	16	192	51	275	2	43	15	56	30	166	21	202
Other pay patients	161	48	3,888	1,301	47	128	3,784	1,115	85	47	131	58
Charity patients	29	141	310	574	12	68	290	447	11	73	26	131
Total	281	669	6,128	6,883	78	364	5,922	5,967	182	565	227	656

TABLE IX.—CONSOLIDATED QUARTERS REPORT.

Stations.	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
Naos Island	....	....	2	3	....	....	2	1	....	2	....	....
Ancon	5	....	1,432	4	....	....	1,410	4	22	....	5	....
Balboa	....	....	816	367	....	....	724	189	89	172	3	6
Corozal	2	....	310	40	....	....	299	37	13	3	....	....
Pedro Miguel	....	....	158	2	....	....	147	2	9	....	2	....
Paraiso	2	....	238	161	....	....	206	124	33	35	1	2
Culebra	....	1	21	21	....	....	21	21	....	1	....	....
Gamboa	....	....	2	6	....	....	1	5	1	1	....	....
Gatun	2	....	165	75	....	....	162	66	4	7	1	2
Colon	4	14	850	616	....	....	850	615	2	4	2	11
Total	15	15	3,994	1,295	....	....	3,822	1,064	173	225	14	21

CONSOLIDATED REPORT OF DAYS LOST IN QUARTERS.

Stations.	White.	Colored.	Total.
Naos Island	3	2	5
Ancon	3,780	124	3,904
Balboa	1,998	846	2,844
Corozal	928	72	1,000
Pedro Miguel	508	7	515
Paraiso	525	460	985
Culebra	47	56	103
Gamboa	2	18	20
Gatun	479	389	868
Colon	2,399	4,763	7,162
Total	10,669	6,737	17,406

CANAL ZONE CONSOLIDATED HOSPITAL AND ADMISSION TO QUARTERS REPORT

	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
Hospital	281	669	6,128	6,883	78	364	5,922	5,967	182	565	227	656
Quarters	15	15	3,994	1,295	....	....	3,822	1,064	173	225	14	21
Total	296	684	10,122	8,178	78	364	9,744	7,031	355	790	241	677

	White.	Colored.	Total.
Total admissions to hospitals, excluding Corozal Farm and chronic ward	6,123	6,829	12,952
Total admissions of employees to quarters	3,994	1,295	5,289
Total	10,117	8,124	18,241
Less number of patients transferred from quarters to hospitals, and between hospitals whose admissions are duplicated in above figures	355	787	1,142
Net admissions to hospitals and quarters	9,762	7,337	17,099
Net admissions of employees to hospitals and quarters	5,639	5,499	11,138
Annual average per thousand of admissions of employees to hospitals and quarters	1,194.96	182.90	320.20

CONSOLIDATED DISPENSARY REPORT OF ALL CASES TREATED BUT NOT EXCUSED.

	Employees.			Nonemployees.			Total.		
	White.	Colored.	Total.	White.	Colored.	Total.	White.	Colored.	Total.
Naos Island	1,308	8,333	9,641	....	....	....	1,308	8,333	9,641
Ancon	28,222	43,483	71,705	19,731	25,028	44,759	47,953	68,511	116,464
Balboa	38,911	45,245	84,156	8,674	5,431	14,105	47,585	50,676	98,261
Corozal	12,493	15,262	27,755	9,401	1,869	11,270	21,894	17,131	39,025
Pedro Miguel	8,024	12,448	20,472	8,284	2,411	10,695	16,308	14,859	31,167
Paraiso	11,294	29,458	40,752	6,959	9,070	16,029	18,253	38,528	56,781
Culebra	441	588	1,029	420	584	1,004	861	1,172	2,033
Gamboa	623	1,874	2,497	263	4,597	4,860	886	6,471	7,357
Gatun	7,878	17,538	25,416	13,310	10,768	24,078	21,188	28,306	49,494
Colon	10,310	27,279	37,589	8,280	9,917	18,197	18,590	37,196	55,786
Total	119,504	201,508	321,012	75,322	69,675	144,997	194,826	271,183	466,009

TABLE XI.—AVERAGE NUMBER OF EMPLOYEES CONSTANTLY SICK IN HOSPITALS AND QUARTERS.

	White.	Colored.	Total.
Ancon	56.51	228.84	285.35
Colon	7.75	16.81	24.56
Total	64.26	245.65	309.91
Treated in quarters:			
Naos Island	.01	.01	.02
Ancon	10.35	.34	10.69
Balboa	5.47	2.32	7.79
Corozal	2.55	.19	2.74
Pedro Miguel	1.39	.02	1.41
Paraiso	1.44	1.26	2.70
Culebra	.13	.15	.28
Gamboa	.01	.05	.06
Gatun	1.31	1.07	2.38
Colon	6.57	13.05	19.62
Total	29.23	18.46	47.69

AVERAGE NUMBER OF EMPLOYEES CONSTANTLY SICK.

Hospitals	64.26	245.65	309.91
Quarters	29.23	18.46	47.69
Total	93.49	264.11	357.60

AVERAGE NUMBER OF EMPLOYEES CONSTANTLY SICK PER THOUSAND.

Hospitals	13.62	8.17	8.91
Quarters	6.19	.61	1.37
Total	19.81	8.78	10.28

TABLE XII.—AVERAGE LENGTH OF STAY IN HOSPITALS OR QUARTERS FOR EACH ADMISSION OF SICK EMPLOYEES.

	White.	Colored.	Total.
Hospitals:	*Days.*	*Days.*	*Days.*
Ancon Hospital	13.42	21.61	19.28
Colon Hospital	7.66	6.91	7.13
Total	12.30	18.86	16.99
Quarters:			
Naos Island	1.50	.67	1.00
Ancon	2.64	31.00	2.72
Balboa	2.46	2.34	2.42
Corozal	2.97	1.80	2.84
Pedro Miguel	3.26	3.50	3.26
Paraiso	2.20	2.89	2.47
Culebra	2.24	2.55	2.40
Gamboa	1.00	3.00	2.50
Gatun	2.88	5.33	3.63
Colon	2.81	7.69	4.87
Total	2.67	5.23	3.39

Subsistence expenses:	
Number of days' rations issued to patients	323,482
Cost of rations issued to patients	$78,213.52
Cost of subsistence per patient per day	$0.241
Operating expenses:	
Number of days' relief furnished patients	323,482
Cost of operation	$443,722.23
Cost per capita per day	$1.371
Cost of operation with amount received from outside patients, etc., deducted	$193,030.90
Cost per capita per day with above deduction	$0.596
Cost of dispensaries	$41,231.24

FINANCIAL STATEMENT.

	Health department expenditures calendar year 1915.	Health department expenditures calendar year 1914.
Administration		$28,106.95
Medical storehouse		6,399.73
Ancon Hospital	$341,548.86	461,056.64
Colon Hospital	44,903.53	34,099.71
Taboga Sanitarium		867.39
Santo Tomas Hospital	11,383.11	10,883.50
Palo Seco Leper Asylum	25,055.93	16,943.94
Corozal Hospital	55,898.09	14,462.55
Other hospitals and dispensaries	49,487.65	73,007.06
Quarantine	59,122.08	51,107.31
Sanitation:		
Panama	43,891.83	34,904.10
Colon	31,850.64	26,368.42
Zone	145,421.54	172,941.50
Street cleaning, etc.:		
Panama	54,104.47	54,215.05
Colon	25,870.94	21,940.52
Repairs to buildings	2,966.66	9,091.46
Total	891,505.33	1,016,395.83

NOTE.—In 1915 administration and cost of operating medical storehouse prorated into operating accounts. Repairs to buildings charged direct to operating accounts since April, 1915.

TABLE XIV.—PATIENTS OTHER THAN EMPLOYEES TREATED IN HOSPITALS, INCLUDING PALO SECO LEPER ASYLUM, AND AMOUNTS RECEIVED FOR THEIR TREATMENT.

	Remaining Jan. 1.	Admitted.	Total.	Number of days treated.	Amount.
Paid for by Panama Republic:					
Insane	173	92	265	64,978	$48,833.30
Colon Hospital	2	221	223	477	1,156.44
Lepers	32	8	40	13,383	9,489.75
Total	207	321	528	78,838	59,479.49
For whom department of civil government pays $2,400 per year (charity)	269	860	1,129	43,399	.....
Outside pay patients	30	973	1,003	13,532	75,965.10
Families of employees, etc. (Zone)	85	2,780	2,865	38,320	49,657.16
Soldiers	94	1,897	1,991	26,151	43,344.72
Residents of Panama, emergency charity cases	1	24	25	155	.....
Total	686	6,855	7,541	200,395	228,446.47

TABLE XV.—SURGICAL OPERATIONS PERFORMED IN HOSPITALS.

	Number.	Died.
Amputations:		
Shoulder	3	2
Thigh	3	.....
Leg	13	1
Foot	3	.....
Digits, multiple	38	.....
Arm and leg	1	.....
Operations on bones:		
Craniectomy—		
Decompressive	6	2
Exploratory	1	.....
Laminectomy	1	.....
Ostiectomy	12	1
Resection of wrist	1	.....
Wiring of fractures—		
Simple	36	.....
Compound	24	.....
Adenectomy:		
Cervical	10	.....
Axillary	2	.....
Inguinal—		
Single	244	.....
Double	76	....
Femoral	13	.....
Herniotomy:		
Inguinal—		
Single	157	.....
Double	22	.....
Herniotomy—Continued.		
Femoral	2	.....
Ventral	9	.....
Combined (any two of the above)	3	.....
Strangulated	5	.....
Genito-urinary:		
Nephrotomy	3	.....
Nephrectomy	1	.....
Ureterotomy	1	.....
Cystotomy	2	.....
Urethrotomy—		
Internal	19	.....
External	20	.....
Prostatectomy	6	2
Varicocele, radical cure	11	.....
Hydrocele—		
Single, radical cure	36	.....
Double, radical cure	3	.....
Orchidectomy	3	.....
Epididymotomy	94	.....
Amputation of scrotum	17	.....
Curetage uteri	97	2
Perineoplasty	4	.....
Trachelorrhaphy	5	.....
Vaginal punctures	4	1

TABLE XV.—SURGICAL OPERATIONS PERFORMED IN HOSPITALS - Continued.

	Number.	Died.
Obstetrical:		
Caesarian section:		
Abdominal	1	.....
Vaginal	1	.....
Accouchment force	1	1
High forceps	3	.....
Low forceps	15	.....
Version	5	1
Perineorrhaphy	13	.....
Thorax:		
Thoracotomy	6	1
Pneumothoracotomy	1	1
Excision of breast	2	.....
Excision of breast and axilla	3	1
Rectum:		
Hemorrhoids, radical cure	100	.....
Fistula in anus, excision of	9	.....
General:		
Thyroidectomy	6	.....
Nerve stretching	2	.....
Varicose veins, excision of	13	.....
Tenorrhaphy	13	.....
Excision of surface neoplasms	39	1
Stab wound of soft parts, operation for	2	.....
Extensive injuries to soft parts, operation for	3	.....
Plastic operation for—		
Congenital defect	1	1
Severe injuries	12	1
Effects of disease	9	.....
Skin graft	25	.....
Laparotomy:		
For general peritonitis	3	1
For tuberculous peritonitis	4	2
For intestinal obstruction	9	2
Exploratory	7	2
Laparotomy—Continued.		
Gastro-enterostomy	18	2
Entero-enterostomy	2	.....
Enterectomy	2	.....
Appendectomy	183	.....
With local peritonitis	18	1
With general peritonitis	2	1
Appendicostomy	1	.....
Resection of rectum	1	.....
Cholecystostomy	11	.....
Cholecystectomy	4	.....
Choledochotomy	1	.....
Abscess of liver—		
Laparo-hepatotomy for	8	3
Thoraco-hepatotomy for	1	.....
Splenectomy	1	.....
Pan-hysterectomy	7	.....
Supravaginal hysterectomy	47	1
Hysteromyomectomy	24	.....
Myomectomy	2	.....
Salpingectomy—		
Single	10	.....
Double	2	.....
Salpingo-oophorectomy	11	.....
Ovarian cystectomy	4	.....
Oophorectomy	2	.....
Suspensio-uteri	39	.....
Plastic operation for chronic pelvic peritonitis	10	.....
For ectopic gestation	3	.....
For trauma:		
General peritonitis	3	1
Gunshot wound of abdomen	1	1
Major operations, various other	242	1
Minor operations, various	1,623	.....
Total	3,602	37

TABLE XVI.—OPERATIONS AND WORK PERFORMED IN EYE, EAR, NOSE, AND THROAT CLINICS.

Operations.	Number.	Died.	Operations.	Number.	Died.
Abscess, brain, drainage of	1	.....	Plastic—		
Adenectomy	122	.....	Eyeball	3	.....
Advancement of internal rectus	1	.....	Eyelid	4	.....
Capsulectomy	1	.....	Face	2	.....
Cataract, needling	1	.....	Nose	5	.....
Cautery to ulcer of nose	1	.....	Pterygium—		
Enucleation	5	.....	Excision	5	.....
Evisceration	3	.....	Transplantation	27	.....
Excision of chalazion	2	.....	Removal of nasal polyp	5	.....
Expression for trachoma	4	.....	Rhinoplasty	1	.....
Extraction of cataract	17	.....	Removal of nasal spur	1	.....
Excision of endothelioma of nose	1	.....	Chalazaion excision	1	.....
Fracture of nose	2	.....	Sinusotomy	13	.....
Incision of surgical abscess	1	.....	Submucous resection of nasal septum	64	.....
Iridectomy	12	.....	Tenotomy	1	.....
Keratotomy	1	.....	Tonsillectomy	202	.....
Lachrymal duct dilated	2	.....	Turbinectomy	7	.....
Mastoidectomy	15	1	Various minor operations	233	.....
Naso-dachryocystostomy	1	.....	Total	770	1
Papilloma, vocal cords, removal of	3	.....	Refractions	2,529	.....
			Outside cases treated	8,240	.....
			Grand total	11,539	1

TABLE XVII.—CONSOLIDATED WARD LABORATORY REPORT—ALL HOSPITALS.

Blood examinations	10,500	Stool examinations—Contd.	
Estivoautumnal	1,817	Bilharzia	9
Tertian	290	Pus and blood	964
Mixed tertian and estivoautumnal	59	Balantidium coli	4
Quartan	17	Entameba, histolytica, and tetragena	34
Differential blood counts	625	Guaiac tests	142
Leucocyte	1,288	Cercomonas, intestinalis	12
Red blood counts	71	Tenis, saginata dispar (ova)	2
White blood counts	10	Blood and mucus	2
Hemoglobin estimations	940	Benzidine tests	22
Secondary anemia	6	Oxyuris	2
Lymphocytosis	4	Urine examinations	22,578
Polsicocytosis	5	Albumen	6,656
Anisocytosis	5	Albumen and casts	3,713
Filariasis	1	Sugar	115
Stool examinations	6,659	Pus and blood	6,185
Ascaris lumbricoides	91	Indican	627
Uncinaria ova	590	Epithelium	4,577
Tricocephalus dispar	373	Bile	242
Strongyloides intestinalis	221	Trichomonas vaginalis	3
Amoba	51	Hemi crystals	9
Entameba	3	Guaiac tests	209
Ciliated monads	155		

TABLE XVII.—CONSOLIDATED WARD LABORATORY REPORT—ALL HOSPITALS—Continued.

Urine examinations—Contd.		Sputum examinations	2,874
Ciliated monads	14	Tubercle bacilli	344
Tripleammonium phosphate	6	Pus cells	2
Amorphous phosphates	4	Pneumococcus	2
Red blood cells	8	Miscellaneous examinations of—	
Quantitative estimation of albumen in urine	7	Pleural effusions	3
Urea determinations	12	Various smears and discharges	391
Sugar, quantitative	7	Spinal fluid	48
Albumen, quantitative	23	Vaginal and urethral discharges	229
Benzidine tests	7	The eye	46
Acetone tests	13	Breast secretion	2
Urea	1	Urine sediment	5
Calcium exalates	2		
Uric acid crystals	2		

TABLE XVIII.—ANCON HOSPITAL—NATIONALITY OF PATIENTS.

Class.	Number treated.	Americans.		Other nations.	
		White.	Colored.	White.	Colored.
Panama Canal employees	4,400	857	8	350	3,185
Panama Railroad employees	1,192	102	.....	60	1,030
Panama pay patients	2	.....	.....	.....	2
Other pay patients	4,818	2,834	1	773	1,210
Charity patients	752	181	.....	52	519
Total	11,164	3,974	9	1,235	5,946
Insane department.					
Panama Canal employees	26	1	.....	8	17
Panama Railroad employees	10	1	.....	.....	9
Panama pay patients	266	.....	1	21	244
Other pay patients	45	23	.....	6	16
Charity patients	87	7	.....	5	75
Total	434	32	1	40	361
Grand total	11,598	4,006	10	1,275	6,307

Number of days' relief furnished patients 267,945
Cost of subsistence per patient per day $0.237

TABLE XIX.—COLON HOSPITAL—NATIONALITY OF PATIENTS.

Class.	Number treated.	Americans.		Other nations.	
		White.	Colored.	White.	Colored.
Panama Canal employees	741	177	.....	104	460
Panama Railroad employees	533	62	.....	29	442
Panama pay patients	225	5	.....	37	183
Other pay patients	535	206	.....	164	165
Charity patients	138	27	.....	18	93
Total	2,172	477	.....	352	1,343

Number of days' relief furnished patients 14,003
Cost of subsistence per patient per day $0.327

NOTE.—Operations at Ancon and Colon Hospitals (see report of all surgical operations). Laboratory reports of Ancon and Colon Hospitals (see consolidated ward laboratory report).

TABLE XX.—PALO SECO LEPER ASYLUM—NATIONALITY OF PATIENTS.

Class.	Number treated.	Americans.		Other nations.	
		White.	Colored.	White.	Colored.
Panama pay patients	41	.....	.....	4	37
Charity patients	20	.....	.....	2	18
Total	61	.....	.....	6	55

Number of days' relief furnished patients 19,152
Cost of subsistence per patient per day $0.23

TABLE XXI.—SANTO TOMAS HOSPITAL.

Class.	Remaining Jan. 1.	Admitted.	Died.	Discharged.	Remaining Dec. 31.
Pay patients	50	1,240	27	1,223	40
Charity patients	45	10,043	889	9,188	411
Total	495	11,283	916	10,411	451

Average number of days' treatment per patient 14.69
Average number of patients constantly sick 455.95
Number of days' relief furnished patients 166,422
Cost of subsistence per patient per day $0.312

Class.	Number treated.	Americans.		Other nations.	
		White.	Colored.	White.	Colored.
Pay cases	1,290	33	.....	462	795
Charity patients	10,488	85	5	1,079	9,319
Total	11,778	118	5	1,541	10,114

OPERATIONS.

	Number.	Died.
Major	1,247	68
Minor	405	.....
Total	1,652	68

DISPENSARY.

Class.	White.	Colored.	Total.
Natives	713	6,222	6,935
Foreigners	819	7,339	8,158
Total	1,532	13,561	15,093

TABLE XXII.—BOARD OF HEALTH LABORATORY.

	Number.		Number.
Bacteriological examinations:		Examinations:	
Fluids and exudates	177	Determination of phenol coefficient of liquor cresolas compositus	1
Blood cultures	164	Experiment in feeding rats with clams for ptomaine	1
Throat cultures (diphtheria suspects)	497	Stools for parasites	17
Cultures from autopsies	42	Leper suspects	11
Stool cultures	223	Animals	35
Urine cultures	331	Rats	11,135
Sputum	75	Blood for malaria	113
Oysters	1	Fabrics for superintendent	2
Tissue (curettings)	1	Blood counts differential	78
Yaws suspect	1	Gonococcus stains	2
Fresh meat for *B. anthracis*	35	Mosquito identification lots	19
Spleens (bovine) for *B. anthracis*	57	Pyorrhea cases	3
Culture from eye	1		
Widals	2		
Pus	3		

TABLE XXII.—BOARD OF HEALTH LABORATORY—Continued.

	Number.
Chemical examinations:	
Sodium fluoride	1
Electrolytes for storage batteries	23
Disinfectant	1
Cottonseed cake	1
Carbolic acid	2
Specimen for division of police	1
Urinary calculus	1
Stools	2
Belladonna suppository	1
Alcoholic beverages	27
Stomach contents	8
Urine	651
Various liquids, fluids, etc	24
Various metals	2
Sugar cane	1
Drugs and chemicals for purity	4
Milk	257
Articles of clothing	1
Commercial product "Pypo"	1
Quinine hydrochloride	1
Ether for anesthesia	1
Dried beet pulp	2
Condensed milk	2
"Jarabe de Ipacac"	1
Aspirin tablets	2
Methyl alcohol	1
Soap	2
Manufacture of liquid "Tanglefoot"	1
Potassium bitartrate	1
"Sal soda"	1
Marine-engine oil	9
Gasoline	8
Kerosene	13
Crude petroleum	1
Epsom salts	1
Water	1
Opium	2
Chloronaptholeum	1
Solution acid phosphate	1
Almond meal	1
Glutin flour	2
Concrete detection of blood	1
Latex of chingumbo tree	1

	Number.
Chemical examinations—Continued.	
Cake	1
Soil, Chiriqui Province	1
Commercial acetic acid	1
Purina dairy feed	1
Rice	2
Beans	1
Mecuric chloride solutions	2
Renal calculus	1
Calibration of lactometer	1
Spinal fluid	2
Bark	7
Miscellaneous:	
Agglutination reactions	34
Autopsies	302
Bodies embalmed	61
Pathological tissues prepared:	
Frozen	56
Paraffin	3,788
Surgical pathological tissues and neoplasms reported	266
Dark field examinations	2
Vaccination, smallpox	6
Vaccine inoculations, antityphoid	6
Vaccine treatment, autogenous, prepared	24
Wassermann reactions	4,203
Animal inoculations	3
Preparations of salvarsanized serum for intraspinous treatment	11
Medical-legal investigations	6
Vaccine points manufactured	27,265
Tuberculin test, cattle	78
Immunization of hogs with hog cholera serum	109
Cremations	51
Interments	299
Autogenous blood serum preparations	2
Animals autopsied	41
Placental blood for malaria	23

TABLE XXIII.—ISSUES OF QUININE.

Month.	Kilograms.	Pounds, avoirdupois.	Month.	Kilograms.	Pounds, avoirdupois.
January	40.00	88.18	September	23.00	50.71
February	42.00	92.59	October	34.33	75.68
March	24.60	54.12	November	42.33	93.32
April	27.50	60.50	December	6.16	13.59
May	35.00	77.16			
June	13.66	30.11	Total	371.18	818.06
July	39.40	86.86	Average per month	30.93	68.17
August	43.20	95.24			

TABLE XXIV.—SANITATION.

CITY OF PANAMA.

Mosquito, rat, and fly work:		
Miles of ditches cleaned		84.4
Miles of ditches dug		14.5
Square yards of pools oiled		4,989,436
Water containers treated		258,683
Mosquito-breeding places found		3,471
Fly-breeding places found		2,435
Quarts of flies trapped		414
Rats trapped		8,136
Disinfection work: Rooms disinfected		100
Material used:		
Crude oil	gallons	44,170
Kerosene oil	do	
Larvacide	do	8,419
Inspection of houses and yards:		
Houses and yards inspected		64,737
Notices served and nuisances abated		2,921
Number of old buildings condemned		193
Number of buildings demolished		63
Number of yards cleaned		49
Buildings:		
Number of plans for new buildings approved		178
Number of permits granted for repairs to old buildings		747
Garbage collection:		
Number of loads of garbage removed to dump and burned		55,444
Total number of cans garbage emptied		1,296,713
Street cleaning:		
Number of square yards of streets cleaned daily		600,000
Number of square yards of streets sprinkled daily		90,000
Vaccinations: Number of persons vaccinated		10,133

COLON, CRISTOBAL, AND MOUNT HOPE.

Water and sewers:	
Number of connections made during the year	60
Total number of connections made to date	1,226
Number of outstanding permits	744
Number of houses in which extensions were made	58
Houses:	
Plans approved	155
Permits to repair issued	831
Permits to occupy issued	69
Number of bills collected for work for private parties	1,233
Sanitation of Colon:	
Loads of yard garbage removed	6,160
Average number of cans of garbage removed daily	2,161
Acres of vegetation removed	404
Acres of streets cleaned	9,941

Sanitation of Colon—Continued.	
Private properties cleaned	2,920
Square yards of pools oiled	402,880
Mosquito-breeding places destroyed	1,215
Water receptacles treated	395,407
Miles of ditches maintained	18
Mosquitoes caught	9,750
Nuisances abated	2,600
Buildings inspected	53,302
Rats killed	3,590
Acres of alleys cleaned	1,440
Acres of streets sprinkled	320
Fly-breeding places destroyed	930
Gallons of larvacide used	4,784
Gallons of crude oil used	9,061
Doses of quinine issued	41,207
Dogs killed	98
Cubic yards rooms fumigated	65,811
Square yards of streets oiled	68,946
Gallons of oil used for streets	2,100
Number cubic yards filling Panama Railroad stables	622
Sanitation of Cristobal:	
Square yards of pools oiled	71,400
Water receptacles treated	45,490
Mosquito-breeding places destroyed	152
Fly-breeding places destroyed	92
Buildings inspected	3,796
Gallons of larvacide used	463
Gallons of crude oil used	1,317
Loads of yard garbage removed	1,783
Cans of garbage removed	157,940
Acres of vegetation removed	176
Nuisances abated	14
Sanitation of Mount Hope:	
Square yards of pools oiled	1,374,720
Water receptacles treated	183,180
Miles of ditches maintained	84
Mosquito-breeding places destroyed	1,251
Miles of ditches constructed	3
Mosquitoes killed in outfit cars	20,619
Mosquitoes killed in barracks	34,878
Gallons of crude oil used	30,496
Gallons of larvacide used	3,220
Cans of garbage removed	22,191
Acres of vegetation removed	349
Fly-breeding places destroyed	14
Private properties cleaned	1
Vaccinations: Persons vaccinated	261

Canal Zone.

Work requests on supply department:	
Grass cutting	153
Screen repairing	88
Miscellaneous	106
Work requests on the engineering department	126
Work requests on other departments	20
Notice served for abatement of nuisances	403
Arrests for violation of sanitary regulations	19
Convictions	18
Building permits approved	7
Inspections of—	
Closets	17,544
Stores	459
Restaurants	14
Shops	1,411
Garbage cans emptied	999,008
Closets disinfected	26,838
Houses disinfected	4

Rat traps used daily (divided by 12)	1,319
Water and sewer connections made	1
Adult anopheles destroyed at houses	140,762
Adult culices destroyed at houses	136,834
Containers found with stegomyia larvæ	94
Adult stegomyia destroyed in houses	480
Sewer connections made	2
Material used:	
Larvacide.....gallons	7,827
Crude oil.....do	151,337
Kerosene used.....do	4,926
Rats destroyed	5,566

TABLE XXV.—QUARANTINE SERVICE.

PORTS OF PANAMA-BALBOA AND COLON-CRISTOBAL.

Vessels inspected and passed	2,062
Vessels detained in quarantine	129
Supplementary inspections of vessels detained	16
Vessels fumigated on arrival	99
Vessels fumigated prior to departure	17
Crew inspected	144,720
Passengers inspected	53,083
Total number of persons inspected	197,803
Supplementary inspections	6,943
Persons vaccinated at ports of arrival because of compulsory vaccination law	6,854
Persons vaccinated at ports of departure or en route because of compulsory vaccination law	9,471
Total number of persons vaccinated	16,325
Persons held in quarantine at the detention stations to complete period of incubation of yellow fever or plague	3,639
Persons held in quarantine on board vessels to complete period of incubation of yellow fever or plague	16,946
Total number of persons held in quarantine	20,585
Persons landed from foreign ports:	
Cabin	23,464
Steerage	14,430
Total	37,894
Persons embarked for foreign ports:	
Cabin	24,782
Steerage	17,238
Total	42,020
Apparent decrease for the year from foreign ports:	
Cabin	1,318
Steerage	2,808
Total	4,126
Persons arriving from coast towns on small craft	25,019
Persons embarked for coast towns on small craft	19,552
Apparent increase for the year from coast towns	5,467
Total number of persons landed	62,913
Total number of persons embarked	61,572
Excess over number embarked	1,341

Less number for Pacific ports	2,651
Total apparent decrease for the year	1,319
Immigrants recommended for rejection	236
Bills of health visèed	1,800
Inspections of docks	520
Inspections of vessels at docks	849

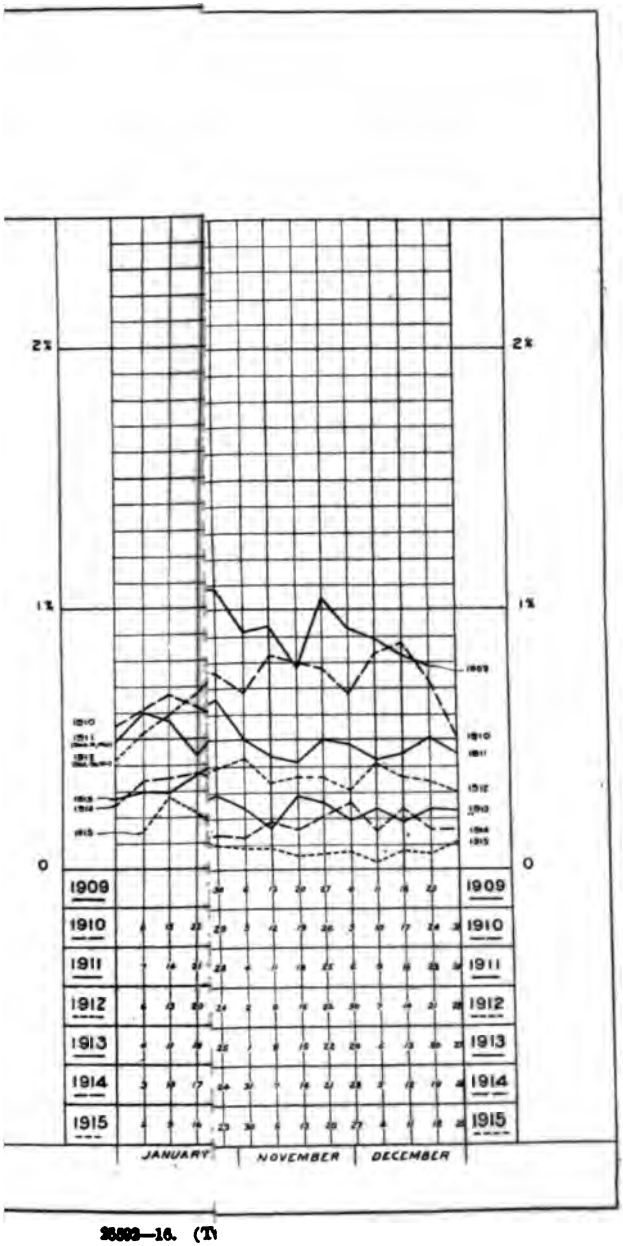
BOCAS DEL TORO.

Vessels inspected and passed	206
Crew inspected and passed	15,397
Passengers inspected and passed	2,533
Passengers, in transit, inspected and passed	2,766
Persons held to complete period of incubation of yellow fever	11
Persons held to complete period of incubation of plague	8

TABLE XXVI.—PERSONNEL REPORT.

[Average monthly number of employees at work during year.]

	1915	1914	Dec. 31, 1915.		
			Officers and employees.	Skilled and unskilled labor.	Total.
Chief health office	4	13	4	.....	4
Medical storehouse	8	8	5	3	8
Quarantine service	42	40	21	17	38
Health office:					
Panama	162	142	21	152	173
Colon	153	130	18	153	171
Ancon Hospital	333	431	257	93	350
Colon Hospital	36	30	28	11	39
Santo Tomas Hospital	5	5	6	.....	6
Palo Seco Leper Asylum	27	19	11	16	27
Zone sanitation	118	125	18	122	140
Hospital farm	49	47	5	50	55
Dispensaries:					
Ancon	.....	5	.....	.....	.....
Balboa	6	6	6	.....	6
Corozal	4	5	.....	.....	.....
Cristobal	.....	4	.....	.....	.....
Culebra	2	4	.....	.....	.....
Empire	.....	5	.....	.....	.....
Gamboa	1	1	1	.....	1
Gatun	4	5	5	.....	5
Margarita Point	1	1	.....	.....	.....
Naos Island	1	2	.....	.....	.....
Paraiso	4	4	4	.....	4
Pedro Miguel	3	3	3	.....	3
Porto Bello	.....	3	.....	.....	.....
Toro Point	.....	2	.....	.....	.....
Total	963	1,040	413	617	1,030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XXVII.—HOSPITAL AND TOTAL CASES OF MALARIA AMONG EMPLOYEES, 1915.

	Admissions.				Died.				Total cases.	
	White.		Colored.		White.		Colored.			
	Hospital.	Total.	Hospital.	Total.	Hospital.	Total.	Hospital.	Total.	Hospital.	Total.
y	33	53	104	115	1	1	1	1	137	168
ry	38	53	83	84	.....	.....	.....	.....	121	137
.....	35	53	80	81	.....	.....	1	1	115	134
.....	15	21	59	60	.....	.....	.....	.....	74	81
.....	37	43	54	54	.....	.....	.....	.....	91	97
.....	69	79	178	178	.....	.....	1	1	247	257
.....	70	105	193	199	1	1	1	1	263	304
.....	48	71	138	146	.....	.....	.....	.....	186	217
ıber	25	45	107	110	.....	.....	.....	.....	132	155
r	25	37	57	58	.....	.....	2	2	82	95
ber	15	20	43	43	.....	.....	.....	.....	58	63
ber	18	26	46	47	.....	.....	.....	.....	64	73
'otal	428	606	1,142	1,175	2	2	6	6	1,570	1,781

	Annual average death rate per 1,000.		Annual average cases per 1,000.		Number of employees.
	Hospital.	Total.	Hospital.	Total.	
y	0.67	0.67	46	57	35,618
ry	.....	.....	42	48	34,266
.....	.35	.35	40	47	34,218
.....	.....	.....	26	28	34,125
.....	.....	.....	32	34	34,600
.....	.33	.33	81	82	36,564
.....	.67	.67	88	101	35,981
.....	.....	.....	59	72	36,024
ıber	.....	.....	45	53	34,827
r	.72	.72	29	34	33,419
ber	.....	.....	20	22	34,224
ber	.....	.....	23	26	33,551
'otal	.23	.23	45.13	51.20	34,785

REPORT

OF THE

DEPARTMENT OF HEALTH

OF THE

PANAMA CANAL

FOR THE

CALENDAR YEAR 1916

D. C. HOWARD

Lieut. Colonel, Medical Corps, United States Army
Chief Health Officer, Balboa Heights, Canal Zone

WASHINGTON
1917

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LETTER OF SUBMITTAL.

BALBOA HEIGHTS, CANAL ZONE, *January 22, 1917.*

Lieut. Col. JAY J. MORROW,
Acting Governor the Panama Canal,
Balboa Heights, Canal Zone.

SIR: I have the honor to submit the following report of the operations of the department of health for the calendar year 1916.

Very respectfully,

D. C. HOWARD,
Chief Health Officer.

GENERAL REMARKS.

Health conditions on the Isthmus during the year have been excellent.

A case of smallpox in a West Indian sailor recently landed was admitted to Ancon Hospital from Panama City on October 18. The disease was contracted prior to his arrival on the Isthmus. Two secondary cases resulted, both in children living in an adjoining room from which the first patient came. Two cases recovered, but the third, a 6-weeks old infant, died November 30. No further cases appeared. With this exception, no cases of quarantinable disease originated on or were brought to the Isthmus during the year.

Two cases of anterior poliomyelitis appeared in the Balboa district on December 12, both in children of the same family. The last previous case of the disease on the Isthmus was in 1912. No secondary cases have appeared.

The annual physical examination of school children in the Canal Zone was completed in November, a total of 1,038 being examined, in whom 918 defects were noted, treatment being required in 682 cases. Free treatment (except dental) is given for defects discovered at these examinations, and the value of this practice is increasingly evident.

The third annual physical examination of gold employees was made late in the year. The results have not yet been tabulated, but its value both to the individual and the service is generally recognized.

Four thousand two hundred persons were vaccinated for smallpox in the terminal cities and the Canal Zone during the year, and 16,681 were vaccinated aboard incoming vessels.

A census of the Canal Zone taken by the police department in June, 1916, showed a population of 31,048, a gain of 1,122 over the previous census taken in July, 1915. The strength of the military

at the end of the year was 7,060. While exact figures are not available, it is believed that the population has increased also in both terminal cities during the year. Over one-half of the employees of the Panama Canal live in the terminal cities.

While the death rates in the terminal cities from most diseases are lower than in cities in the United States, the exceptions are found in the higher death rates for tuberculosis, especially among the blacks, and in children under 1 year of age. The general good health of the cities of Colon and Panama, with the two exceptions noted, is due in part to the most excellent water supply piped to all houses and a proper sewerage system. Without constant anti-mosquito work, however, malaria would be very prevalent, as all houses in the terminal cities are unscreened. Racial predisposition, overcrowding, and insufficient food are responsible in great part for the high death rates from tuberculosis in the terminal cities. The problem, therefore, is an economic one in great part rather than sanitary. Steps have been taken by the health department in Panama, assisted by local charitable organizations, to carry on work along educational and preventive lines to improve economic and other conditions where possible in the effort to reduce the tuberculosis rate in Panama. It is necessary that the available area for new buildings be increased in Panama City, and it has been recommended that the water mains and sewers be extended to the "Savanas" district to permit of expansion of the city in this direction. At present building permits can not be issued for construction in unimproved districts.

The high infant mortality rate in Panama City is closely related to poverty and malnutrition. There has been established in connection with the health office a bureau of infant welfare, and encouraging results are being reported of the work already done. Plans are in preparation for extending these activities through the promised support of influential Panamans who are deeply interested in the work of this bureau.

The revised and amended "Sanitary Rules and Regulations" for the terminal cities, which were submitted to the Panama Government in July, 1915, with request for publication, after many months of correspondence and conferences, were finally adopted and published as official decrees, the last under date of September 14, 1916. All sanitary ordinances, including those recently adopted, have been compiled and published in booklet form and are now in full force in both cities. Until quite recently this department has not had the full cooperation and support of the Panama Government in the matter of collection and accounting of fines and penalties imposed by the health officers of Panama and Colon for violation of sanitary regulations. It was necessary a few months ago to take the matter up with the Panama Government, calling attention to the large proportion of fines which remained uncollected and to the failure of the municipal treasurer to carry the collected fines as an "emergency fund, to be used only in special cases for sanitary purposes," as required under the sanitary code. This matter has not yet been settled, but a better spirit of cooperation appears evident in other matters, and a satisfactory adjustment is anticipated soon.

VITAL STATISTICS.

EMPLOYEES.

The health of employees in 1916 was better than in any previous year during the history of the canal.

The average number of employees on the rolls of the Panama Canal, the Panama Railroad, and contractors doing work for the Panama Canal, for the year was 33,176, as compared with 34,785 for 1915, and 44,329 for 1914.

The total admission rate to hospital and quarters was 282.76 [1] as compared with 320.20 in 1915, 401.54 in 1914, and 519 in 1913. (See Chart I, p. 35.) There was a net reduction of 12 per cent in the admission rate from that of the previous year, which was then the lowest rate of record. For disease alone, the admission rate to hospitals was 103.72, as compared with 143.82 in 1915, 182.57 in 1914, and 246.91 in 1913. The total admission rate to hospitals only was 140.43 as compared with 186.17 for 1915, 244.49 for 1914, and 351.10 for 1913.

The total death rate was 6.03 as against 5.77 in 1915, 7.04 in 1914, and 8.35 in 1913. (See Chart II, p. 36.) The death rate for disease alone was 4.58 in 1916, as against 4.05 in 1915.

The constantly noneffective rate from all causes was 9.20 for 1916, which is the lowest rate of record, as compared with 10.28 for 1915, and 12.22 for 1914. (See Chart III, p. 37.)

Of particular interest is the continued improvement in rates for malaria, which disease heretofore has been the principal cause of disability among employees. Malaria has now been supplanted as the leading cause of admission by the group of venereal diseases. The admission rate to hospital and quarters in 1916 was 16.49 as compared with 51.20 for 1915 (see Chart IV, p. 38), a reduction of 68 per cent from the rate of the latter year. There were only two deaths from malaria among employees, both blacks, making a death rate of 0.06 in 1916, as compared with 0.23 in 1915 (see Chart V, p. 39), a net reduction of 73 per cent. There were no deaths from malaria among American employees; 0.59 employees per 1,000 were constantly sick with malaria in 1916, as compared with 1.19 for 1915. With the completion of the permanent sanitary work now in progress, it is believed that malaria will be practically eradicated from our sanitated districts and the terminal cities, if the present standard of maintenance work is continued. Cases of the disease may be expected to occur now and then among laborers working in outlying districts in which antimosquito work is not carried on, as with clearing gangs, mapping parties, etc., unless rigid individual precautions are taken.

The admission rate for dysentery was: Amebic, 0.24; bacillary, 0.03; clinical, 0.33. The corresponding rates for 1915 were 0.14, 0.06, and 0.55; and for 1914, 0.38, 0.18, and 1.24.

The admission rate for typhoid fever was 0.66, as compared with 0.11 in 1915, and 0.52 in 1914. There were three deaths from typhoid fever among employees during the year.

[1] All morbidity and mortality rates are computed as equivalent annual per 1,000.

The five diseases causing the highest number of hospital admissions, with their rates, were as follows:

	Admissions.	Rate.
Venereal diseases	521	15.70
Malaria	502	15.13
Diseases of the eyes and adnexa	122	3.68
Tuberculosis (various organs)	107	3.22
Influenza	94	2.83

The five diseases causing the the highest number of deaths, with their rates, were as follows:

	Deaths.	Rate.
Tuberculosis (various organs)	36	1.09
Pneumonia (including lobar and broncho)	31	.93
Bright's disease (chronic nephritis)	20	.60
Organic disease of the heart	12	.36
Cerebral hemorrhage	9	.27

There were 36 deaths from tuberculosis among employees against 27 in 1915; from pneumonia 31 deaths against 25 in 1915. The increase in the number of deaths from these two diseases accounts for the slightly higher death rate for 1916.

Effects of Race.

The admission rate to hospitals and death rate for disease for white employees were 267.35 and 3.29, as compared with 77.70 and 4.79 for black employees. The noneffective rate for disease and injuries for white employees was 17.76, as compared with 7.84 for black employees.

The admission rate to hospitals and quarters for malaria was 39.54 for whites, as compared with 12.82 for black employees.

The admission rate to hospitals for disease for Americans was 209.81; the death rate for disease was 1.67; the admission rate for malaria to hospitals and quarters was 27.62.

Effects of Season.

The highest death rates for disease occurred in the months of April and December, and the lowest in July and August. The highest admission rates to hospitals for disease were in January and February, and the lowest in September and November.

Canal Zone.

[Employees and nonemployees.]

With an average population of 31,447 in the Canal Zone, there was a total of 343 deaths during the year. Of these, 290 deaths were from disease, giving a rate of 9.22, as compared with 11.30 for 1915 and 13.24 for 1914.

The birth rate for the year was 20.42. The infant mortality rate, based upon the number of births reported for the year, was 42 for white and 149 for colored children, with a general average of 121

The percentage of stillbirths to total births was 6. Of the total deaths from disease, the percentage under 5 years of age was 43.

Below is a table showing the death rates for the Canal Zone from 1905 to 1916, inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	23,463	828	35.29	1911	90,434	1,385	15.32
1906	34,095	1,700	49.86	1912	79,279	1,129	14.24
1907	54,036	1,708	31.60	1913	61,700	1,047	16.97
1908	67,146	1,273	18.95	1914	46,379	710	15.31
1909	76,900	1,025	13.33	1915	31,946	410	12.83
1910	86,465	1,251	14.47	1916	31,447	343	10.91

Panama City.

The population of the city, according to the census of December, 1915, was 60,778, among whom there were a total of 1,765 deaths. Of these, 1,702 deaths were from disease, giving a rate of 28, as compared with 28.97 for 1915 and 32.85 for 1914.

There were 2,598 births reported for the year, giving a rate of 42.75. The infant mortality rate, based upon the number of births reported during the year, was 237. The percentage of stillbirths to total births was 9.

Of the total deaths from disease, the percentage under 5 years of age was 51.

Herewith is a table showing the death rate in Panama City from 1905 to 1916, inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	21,984	1,447	65.82	1911	46,555	1,456	31.27
1906	25,518	1,142	44.75	1912	47,057	1,380	29.33
1907	33,548	1,156	34.45	1913	47,172	1,507	31.95
1908	37,073	1,292	34.83	1914	53,948	1,863	34.53
1909	40,801	1,038	25.44	1915	60,373	1,810	29.98
1910	45,591	1,446	31.72	1916	60,778	1,765	29.04

Colon.

The population of the city, according to the census of December, 1915, was 24,693, among whom there were a total of 696 deaths; of these deaths 662 were from disease, giving a rate of 26.81, as compared with 20.59 in 1915 and 24.20 in 1914. The increased death rate shown for Colon over last year is more apparent than real. The number of deaths was practically the same, but the rate last year was based on a population of 29,331, while for this year on 24,693, considerably less than the actual population.

Herewith is a table showing the death rate in Colon from 1905 to 1916, inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	11,176	553	49.48	1911	19,947	527	26.42
1906	13,651	702	51.42	1912	20,174	493	24.44
1907	14,549	571	39.24	1913	20,232	489	24.17
1908	15,878	418	26.32	1914	23,265	590	25.36
1909	17,479	396	22.65	1915	29,331	640	21.82
1910	19,535	514	26.31	1916	24,693	696	28.19

The birth rate for the year was 33.90. The infant mortality rate, based upon the number of births reported during the year, was 228. The percentage of stillbirths to total births was 7. Of the total deaths from disease, the percentage under 5 years of age was 42.

DIVISION OF HOSPITALS.

Ancon Hospital.

The first unit of the permanent hospital, section "A," was turned over for occupancy by patients in June. All white American male patients were taken care of in this section.

The following hospital buildings were demolished to make way for new construction:

Building No. 287 (board of health laboratory), on site of which the permanent dispensary is being erected.

Buildings 253, 255, and 257 (wards 1 and 2, and service building), on whose site is being erected the second unit of the permanent hospital—section "B."

Building 231 (attendants' quarters), to make room for type 17, revised, gold quarters for quartermaster's department.

Building 235 (wards 13 and 14, and eye and ear clinic and operating room), on the site of which the permanent board of health laboratory is being erected.

The above new hospital buildings will be ready for occupancy about March 1, 1917.

The present crematory was turned over by the building division in January, 1916, and has been in operation throughout the year.

New boundary lines were defined for the hospital reservation, which removed the following houses from the limits previously obtaining: Nos. 201, 518, 520, 522, 334, and 335.

Physicians and nurses.—In 1914 there was a reduction in the force of all employees in this hospital because of a reduced number of patients and because it was expected that the number would continue to decrease with the anticipated reduction of the canal force.

However, in 1915 the minimum number of patients was reached, and since that date there has been a gradual increase in the number of patients. The total number of hospital days treatment for 1916 was 270,294, as against 268,945 for the preceding year. As a result, all departments of the hospital have been constantly running with the minimum number of employees necessary to do the work. This has been especially true as regards physicians and nurses. Consequently there are many occasions when the demands on the personnel are greater than they should be to produce efficient results.

Two physicians in addition to those now authorized are needed. Another rating, with increased pay, is also recommended for such physicians as have demonstrated their efficiency. Unless this is done, it will be impossible to retain good men; better inducements and prospects being offered in other places.

Four nurses, in addition to the present allowance, would relieve the present conditions. Two head nurses, one as supervising night nurse, are desired, but nurses for these positions can not be spared under present conditions.

There were no important changes in the nurse corps during 1916 except the appointment of five head nurses and a change in rating, giving nurses subsistence while on leave.

Transportation.—The only daily animal transportation at present in use is a double team used two hours each day to meet the hospital cars on the noon trains, the balance being replaced by motor transportation consisting of—

Date placed in service:	
March, 1915	1-ton truck.
December, 1915	1½-ton truck.
September, 1915	Hearse.
April, 1916	Heavy chassis ambulance.
June, 1916	1-ton trailer.
August, 1916	Light chassis touring car.
October, 1916	Light chassis ambulance.

The replacement of animal by motor transportation at Ancon Hospital has effected a saving for the year of approximately $3,500, including depreciation.

Grounds.—The usual care was taken of lawns, gardens, plants, hedges, etc., and considerable work was involved in replanting due to new construction. Every effort possible was made to save plants for use around the new buildings when completed.

The organization of the hospital has been improved, the work of the various clinics coordinated, and all service is being rendered at a high standard of efficiency.

Herewith following is a statistical summary of some of the work performed during 1916:

Patients admitted to Ancon Hospital during year	9,116	
Patients admitted to Corozal Hospital during year	225	
Chronic patients admitted to chronic ward	26	
Crippled employees admitted to Corozal farm	59	
		9,426
Major surgical operations	1,465	
Minor surgical operations	1,333	
Eye and ear operations	622	
		3,420
Refractions		1,378
Obstetrical cases delivered		346
Deaths during year in Ancon Hospital	325	
Deaths during year in Corozal Hospital	57	
		382
Patients transferred to other hospitals for treatment, etc		151
Out-patient department (medical, surgical, eye and ear clinics):		
Total visits		13,888
Prescriptions written		6,289
Average number of physicians on duty, hospital and dispensary		22
Average number of nurses on duty, hospital and dispensary		67
Average number of attendants on duty, hospital and dispensary		101

Enlisted men treated at Ancon Hospital.

	1916	1915	1914	1913
Number of admissions	1,937	1,771	1,458	304
Days relief furnished	28,519	24,643	19,506	5,850
Number constantly sick	78.13	67.51	53.40	16.00

Expenditures and revenue received from patients.

	1916	1915	1914	1913
Operating expenses	$406,390.70	$382,195.66	$493,440.84	$535,112.05
Capital expenses	10,797.84	9,152.29	5,173.55	7,062.04
Total expenses	417,188.54	391,347.95	498,636.39	543,174.09
Revenues	227,021.78	230,256.70	231,392.32	208,325.00
Net operating expense	179,368.92	151,938.96	262,068.52	336,787.05

COROZAL HOSPITAL.

Corozal Hospital has continued under the general supervision of the superintendent, Ancon Hospital. Great improvements have been made in the hospital and farm during the year as the result of a general reorganization.

The following permanent buildings were added to the hospital during the calendar year: A modern concrete fly-proof compost pit; a carpenter shop; a modern chicken house, with concrete base, capacity 2,000 chickens; the pigeon house was improved by addi-

ill will also be used in connection with the proposed hydro-
r plant.
hospital kitchen was enlarged and an attractive dining room
ed for physicians and nurses.
ital department.—There was a total of 268 patients remaining
asylum on January 1, 1916. During the year the movement
ents was as follows: Two hundred and twenty-two admissions,
charges (including 34 deportations), and 56 deaths, leaving
of 316 patients remaining at the end of the calendar year.
total remaining, 187 were males and 129 females, including
e and 20 female nonresidents.
effort is being made to keep complete records and histories
provide amusement, exercise, and occupation for the
s.
department.—The farm department has been reorganized
e position of assistant farm manager created. The number
oles on the farm at the beginning of the calendar year was 56,
is number had increased at the close of the year to 66, of
10 were whites and 56 colored. No deaths occurred among
oples during the year.
y.—During the first half of the year the method of conducting
ry was changed and an experienced man, specially trained
ying, was placed in charge of the dairy and piggery. The
d adopted has been that of the best dairies in the States, and
ıl laboratory check of the products is kept up to insure the
ted standard of excellence.
results obtained at the dairy have been beyond all expecta-
The daily bacterial count of raw milk averaged less than
er cubic centimeter and at times as low as 500 per cubic
eter. Because of the demand for pasteurized milk a pasteur-
s installed. This has reduced the daily bacterial count to
rage of less than 100 per cubic centimeter per day. All
s are sterilized by steam, and every effort is made to supply
ual if not better than that supplied from any dairy in a
ate climate.
supply of milk has been greatly increased, so that besides

Piggery.—At the close of the year the piggery included 4 registered boars, 63 hogs, 63 pigs, and 55 sucklings, or a total of 185. The total revenue from this branch for the year was $1,681.81.

Poultry.—The flock numbered 15 cocks and 469 hens at the end of the year, but a shipment of 500 Rhode Island Red hens had already been shipped from the States. With the arrival of the new flock it is expected that all demands for eggs will be supplied. The new flock will be placed in the new concrete chicken house, which was practically complete at the end of the year. Two thousand five hundred and four dozen eggs were sold for a total of $1,514.98. The revenue from the poultry yard for the year was $1,737.95.

General.—The increased revenue from the farm during the latter part of the year resulted in a net income of several hundred dollars for this department alone for the month of December.

Detailed statistics of Ancon and Corozal Hospitals are shown in Tables VII, XIII, and XV.

BOARD OF HEALTH LABORATORY.

A full report of the work of this laboratory during the year will appear in the Proceedings of the Medical Association of the Isthmian Canal Zone, Volume X, for 1917. The work reported is of great interest, and it is regretted that, due to lack of space, it can not be included in full in this report. The more important features of general interest follow:

Wassermann tests.—During the year 8,633 Wassermann tests were made on 6,728 individuals, with results as follows:

Positive	1,603
Negative	5,130

Separating these findings according to race gives the following per cent positive:

White Americans	16.4
Spaniards and white natives	26.0
Blacks and mulattoes	30.0
Total—per cent positive	24.8

In addition, Wassermann tests were made on 41 spinal fluids in as many individuals, and of these, 15, or 36.5 per cent, were positive.

Cultures.—During the year 913 cultures were examined for *B. diphtheria.* One hundred and one positive cultures were obtained on 53 individuals. The cases were practically all sporadic, evenly distributed over the Isthmus and throughout the year.

B. typhosus was recovered from blood cultures 30 times and *B. paratyphosus* 4 times. Of the typhoids, 6 came from Colon, 10 from Panama, 3 from the ships, and the rest from various stations along the line. Of the paratyphosus, 2 came from ships, 1 from Cristobal, and 1 from New Gatun.

Bacteriological examinations of stools and urines were made from the inhabitants of localities in Gatun from which typhoid patients had come on two occasions, but each time with negative results.

The meningococcus was recovered but once during the year. The patient was a soldier who had been on the Isthmus but 30 days. Serum treatment was promptly instituted and recovery uneventful.

Surgical pathology.—There were 560 surgical specimens received and examined at the laboratory during the year. The majority came from Ancon Hospital, but some were received from various points along the Canal Zone. Tabular statement of the findings will be published in the complete report. The following are some of the unusual findings:

Two cases of leprosy found in specimens of amputated great toes. Two cases ainhum recorded. Three cases of gangrene of the feet due to chronic arterial disease. One case of Hodgkin's disease. A large chronic spleen which had bled from stellate lines of rupture in its capsule. A rudimentary kidney that had a superimposed inflammatory disease. A thyroid gland that was the seat of inflammatory disease rather than cystic change or tumor growth. A specimen of *Dermatobia cyaniventris* that had been removed from an eyelid.

Miscellaneous report (surgical and autopsy materials excepted).—Dark field examinations: Syphilis 54, yaws 4. Placental films examined: Two hundred and thirty-four, seven of them positive for malaria. Leper suspects examined, 30; 14 were positive. Blood films from animals examined: Horses 13, cows 6, dogs 3. Examination of stools 3, urine 1, test meals 5, spinal fluid 1. Films searched for gonococcus: Eye 14, vagina 3. Parasites received for identification: *Filaria immitis. Schistosomum hematobium* (ova in urine). *Tenia saginata.* Report on specimen of pleural fluid, 1. Report on examination of a lesion of the hand, 1. Inspection and report on condition of fetus, 8.

Animals.

Rats examined:		
Mus musculus	8,988	
Mus norwegious	6,094	
Mus rattus	2,189	
Mus alexandrinus	130	
		17,401
Hogs examined		128
Cows and calves examined		62
Guinea pigs examined		16
Dogs examined		9
Rabbits examined		5
Cats examined		3
Monkeys examined		3
Fowls examined		2
Horses examined		1
Armadillos examined		1
Kept under observation:		
Hogs	4	
Dogs	4	
Cat	1	

Microscopic report on specimens of animal tissue received 12.

General remarks.—Three hundred and twenty-two autopsies were performed during the year, which represents 70 per cent of the bodies passing through the laboratory. It must, of course, be kept

in mind that the mortality rate expressed for one disease during the year does not represent, in full, the morbidity rate of this disease among the individuals that have been autopsied. A disease may be a cause of death in one instance and in another simply a contributory factor. For example, the causes of death listed under the titles of tuberculosis and syphilis do not indicate the true incidence of these diseases among the 322 autopsies.

Syphilis, one of the most important diseases to the clinician and pathologist, escapes indictment as a cause of death more than any other disease that is prone to be followed with important sequalæ that can kill. This disease in its active stages seldom kills but the tendency for it to localize in the vascular system causes lesions which may produce aneurysm, aortic endocarditis, aortitis, cerebral hemorrhage and softening in young adults; or on the other hand some diseases like general paralysis of the insane. Because these lesions are so definitely located in a special system and are so remote from the active stages of the disease, syphilis almost never is indicated as the cause of death while tuberculosis is never lost sight of in this manner. It would appear that when syphilis could be well established by autopsy, and laboratory tests, in conditions like those named above it should be named as the disease which caused death. It is difficult to set hard and fast rules in recording causes of death. Note that many essentially, respiratory, circulatory, nervous, and digestive tract diseases are really placed under some of the general diseases while on the other hand many diseases named under the special systems do not disclose the real etiology of these lesions.

Inspection of the anatomical report will show that during the year 1916 tuberculosis led all other diseases by a very wide margin as a cause of death. It has prevailed almost entirely among the negroes. Seldom did an autopsy disclose in this race an arrested or encapsulated lesion of tuberculosis. Surgical lesions among the negroes were chiefly found in lymph-nodes of the superficial sets and in the male external genitalia. Such a lesion in the bones and joints is far less common than is to be expected among white people. The diseased produced by the pneumococcus (pneumonia, empyema, meningitis, arthritis, pericarditis, etc.) stand next in order as an important fatal factor. Almost on the same level belongs chronic nephritis, and then comes the combined types of external violence. It is reasonable to expect a high rate of chronic nephritis among these young black adult laborers who have been employed under tropical conditions and who have in the past been the victims of acute diseases such as malaria and dysentery, and many of them in addition having suffered from syphilis and gonorrhea.

Malaria, dysenteries, and other tropical diseases are at a very low ebb. Evidence of the first mentioned disease is at times noted at autopsy but it indicates only a latent type. Uncinariasia is much less frequently noted than in former years. Disregarding the causes of death and considering only the most frequent pathological factors discovered at autopsy during the year 1916, tuberculosis and syphilis are found to stand well above all others and offer the difficult elements to be fought in the future. Malaria is still the most important tropical element from an economic standpoint and for this

reason it is chosen with the two diseases named for a tabular study that will show incidences of the three conditions as found at autopsy.

The occurrence of the three most important diseases in the 322 autopsies:

	Tuberculosis.	Syphilis.	Malaria.
Negroes	81	76	35
Natives	13	7	4
Whites	3	4	3
Males	72	70	30
Females	25	17	12
Children	15	5	12
Adults	82	82	30
Wassermann positive	.....	73	.....
Tertiary lues—no Wassermann	.....	14	.....

Reference to the list of causes of death will show the relation tuberculosis and syphilis bear to the general incidence of the two diseases.

Neoplasms.—In a young and selected population, and in one so largely composed of negroes, the malignant neoplasms are not to be expected in large numbers. However, the present year's record still bears out the belief that cancer is not as infrequent among the negroes as is generally believed. Sarcoma has been found less often than cancer.

Leprosy.—No cases have come to autopsy during the year. Several suspects have been examined, as already indicated, and 14 found positive. In the chronic types of this disease showing ulcers of the feet and hands and no skin nodules or nasal lesion, experience has shown that better results toward establishing a diagnosis can be obtained by amputating a digit with an ulcer and subjecting the tissue to an examination at a more remote area than the site of the ulcer.

Animals.—The rats have not revealed important findings during the year 1916. The specimens have come from all parts of the zone as well as the terminal cities, but the bulk of them have been catches at the Pacific terminus.

Hogs.—Hog cholera still commands attention and is the chief fatal disease appearing among these animals.

Cattle.—The presence of southern cattle fever or a disease similar to if not identical with it has been found in calves at the Corozal Hospital farm and in 25 cows and calves at the Miraflores pasture.

Dogs.—No cases of rabies have been received at the laboratory.

Chemical.—An examination of the Pistia plant to determine its value as a source of potassium gave the following results:

Potassium constitutes 8.10 per cent of the mineral matter or ash, which is 57.3 per cent of the moisture-free plant. Of this amount, 3.60 or 44.4 per cent of the entire amount may be extracted by maceration of the plant with water. The process of recovering

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the potassium is seriously complicated by the high percentage of mineral matter associated with it. To remove the organic matter sufficiently to permit of the extraction of the potassium requires the use of external heat, which is always costly. However, preliminary experiments have indicated that an electrolytic process might be applied economically without the destruction of organic matter of the plant. This will be the subject of further work.

A consideration of the behavior of petroleum when used as a larvacide led to the study of the methods of modifying the oil so that its spreading power, and therefore its efficiency, might be increased. Tests made on a small scale in the laboratory with a cracking process yielded a product that was thinner in consistency, with a better spreading power, and very much more rapid in its larvicidal action. Efforts to develop the process efficiently on a larger scale without special equipment have not so far been successful.

Twenty-three determinations were made of the fat in the livers of children dying of various diseases. The percentages on the dry basis ranged from 6.35 to 81.98 per cent without the slightest reference to the condition found at autopsy or the age of the child.

Mosquitoes.—The mosquito census was continued throughout the year. This consisted of examination and classification of all the mosquitoes taken in the daily hand catch in quarters and barracks at all line stations, military posts, and at Colon and Cristobal, which are mailed to the laboratory after catching. A daily report is mailed to the sanitary inspector in charge of each district and to the surgeon at each post, giving the number and identification of the mosquitoes taken in his district.

From January 1 to December 31, 1916, inclusive, the total number of mosquitoes of all varieties classified was 391,326, as follows:

Anopheles albimanus	55,365
Anopheles tarsimaculata	3,813
Anopheles argyritarsis	4
Anopheles pseudopunctipennis	45
Anopheles apicimacula	19
Anopheles malefactor	114
Mansonia titillans	242,957
Mansonia fasciolatus	265
Mansonia nigricans	67
Aedes taeniorhynchus	2,154
Aedeomyia squamipennis	13
Lutzia allostigma	3
Aedes (stegomyia) calopus	2,068
Culex and allied genera	76,145
Wyeomyia	990
Lesticocampa	62
Psorophora	35
Deinoceritis	36
Sabathes	1
Joblotia	11
Haemagogus	3
Damaged Anopheles	7,155

The distribution according to districts from which the mosquitoes were collected will appear in the complete report when published.

In March, 1916, our entomologist discovered the breeding places of a type of mosquito with peculiar habits and life history in the Canal Zone. This species of mosquito, known as *Mansonia titillans*, differs from other mosquitoes by passing its entire larval and pupal stage beneath the surface of the water attached to the water lettuce, *Pistia stratiotes*, which is so abundant in the canal near Gamboa, in Gatun Lake, and in several of the rivers emptying into the lake.

Ordinarily mosquito larvæ live free in the water and secure their air supply at the surface of the water, but *Mansonia titillans* have breathing tubes in both the larval and pupal forms so modified as to enable it to pierce the rootlets of the *Pistia* and obtain its supply of oxygen directly from the plants at some distance from the surface of the water. Oil spread over the surface of the water is therefore not a larvacide for this species.

The *Pistia stratiotes* is a rosette of green wedge-shaped leaves. The leaves are broad and flat at the apical end, with a central indentation. The roots are long and filamentous. These plants grow on the surface of the water in large number near the edge of the lake and rivers, where the water is quiet, and they are protected from the winds and currents. They multiply rapidly and soon form large masses. They seem to propagate by seed and also by runners, one plant sometimes having five or six young plants attached to it, each one at the end of a slender rod-like branch or runner.

Strong winds or heavy rains causing an elevation of the water tend to set these masses of plants in motion, and they float about on the surface of the water at the action of the winds or currents until they are swept into protected coves or lodge between the dead trees in the inundated area. The roots of these plants are sometimes several feet in length and hang straight downward in the water. They consist of innumerable filaments and generally have a quantity of decayed vegetable matter and débris attached to them.

It is in this mass of filamentous rootlets that the larvæ and pupæ of *Mansonia titillans* are attached. The larvæ attaches itself to one of the thread-like filaments by puncturing the outer surface with its air tube, which is modified for this purpose. It then inserts the end of the air tube in the puncture and remains attached in this manner. The pupæ performs practically the same process. The roots furnish the larvæ with a plentiful supply of oxygen, and the thickness of the mass serves to protect them from the small fishes.

This manner of living during the immature stages of this species has been known for some time, and it has also been known for several years that the adult mosquito of this species were abundant in the Canal Zone, but the larval and pupal forms had never been found here before. While they are found attached to the roots of the water lettuce, thousands of these plants may be examined without revealing any larvæ, as certain other conditions are also necessary for a favorable breeding place, such as shade, protection from winds and currents, etc.

In pursuance of investigations on this species of mosquito and their habits the entomologist has visited various places in the zone at different times, and has inspected the Mandingo, Chagres, Palenque, Chilibre, Rio Grande, Cano, and Gatun Rivers. No *Pistia* plants were found in either the Rio Grande or Gatun Rivers. Along the edges of the Chagres are numerous small bays and indentations covered with *Pistia* plants, and many of them having *Mansonia* larvæ attached. In lower parts of the Chilibra and Palenque, near their junction with the Chagres, many acres of the plants were found covering the surface of the water, being prevented from floating down the Chagres by being entangled in a mass and by the dead standing timber, fallen trees, and growths of rank grass that serves to bind the plants together by growing up between them. About 5 per cent of the plants in these two rivers were found to have larvæ attached. In the Cano River about 3½ to 4 miles from the canal the *Pistia* plants were found so thick that in most places the surface of the water was entirely covered with a solid carpet of green plants growing between the dead trees. There were several square miles of masses of these plants found in this region, and about 85 per cent of them were found to be harboring larvæ. The number of larvæ found on the plants examined ranged from 1 to 47. In this river one plant was found with roots over 3½ feet long floating on the surface, where the water was 27 feet deep, that had 44 larvæ attached to its roots. The Mandingo also has many acres of the plants with many larvæ attached. Besides in the rivers mentioned, plants harboring larvæ were also found at different places along the lake shore and in pools at some distance from the lake.

The largest number of larvæ attached to one plant were found on a plant about 14 inches in diameter taken from the water near the former site of the Bas Obispo station. This had 51 medium and large-sized larvæ attached to its roots.

At present this mosquito greatly outnumbers any other species of mosquitoes found in the Canal Zone. The total number taken during the past year in the daily hand catches in quarters and barracks were 242,957 *Mansonia titillans*, against 148,369 of all other varieties of mosquitoes combined.

Biting experiments were made to determine if *Mansonia titillans* would prove to be a possible factor in the transmission of dengue fever. The one test that was made proved negative. Owing to lack of dengue patients this work could not be carried out as extensively as desired. In connection with this work the entomologist made a number of trips to various places on the Zone to collect larvæ of this species of mosquito. Larvæ of this same species, collected at Bas Obispo, and sent to the laboratory daily from Las Cascadas, were bred out and the adults used for this work.

Observations on the biology of *Dermatobia cyaniventris* were made, with experiments to determine if half-grown larvæ could be successfully transplanted from one animal to another, which proved successful.

Extended observations on the "screw-worm fly," *Cochliomyia desvoidyi*, have been carried out, and a complete report of this study will be presented later.

A collection is being made of the snakes found in the Canal Zone and vicinity. During the year a total of 43 specimens were received, being obtained through purchase, and by presentation to the laboratory. This number represents a total of 13 genera and 16 separate species. This includes 11 specimens of the "Coral snake," *Elaps fulvius;* 2 of the tropical coral snake, "*Elaps Margravii;*" 7 of the "Mapana," *Leptodire albofusca;* 3 of the "Green tree snake," *Oxybelis fulgidus;* 1 of the "Pike-headed snake," *Oxybelis accuminatus;* 2 of the "Large boa," *Boa imperator;* 1 of the "Common boa," *Boa constrictor;* 3 of the "Rainbow boa," *Epicrates cenchris;* 3 of the "Blunt-headed snake," *Leptognathus catesbyi;* 3 of the "Red snake," *Pseudoboa neuwiedii;* 2 of the "Yellow-bellied sea snake," *Hydrus platurus;* 2 of the *Leptocalamus torquatus;* 1 of the *Spilotes pullatus;* 1 of the *Erythrolamprus aesculapii;* 1 of the *Zenoden colubrinus;* and 1 of unidentified "Striped snake."

When sufficient data has been collected it is contemplated to catalogue the snakes of the Canal Zone, with annotations on the appearance and habits of each species and other data that may be obtained.

A number of reptiles, batrachians, and mammals were received at the laboratory during the past year and examined for ectoparasites. These consisted of the 43 snakes mentioned above, 6 toads, *Bufo marinus;* 2 large iguanas, *Iquana tuberculata;* 1 large lizard, *Cnemidophorus sp.;* 1 nine-banded armadillo, *Tatu novemcinctum;* 1 Batty's opossum, *Didelphys marsupialis battyi,* and 1 Earl of Derby's opossum, *Caluromys derbianus.* The iguana ticks, *Amblyomma dissimile,* in various stages of development, were found on about 70 per cent of the snakes, on 90 per cent of the toads, and on both the iguanas. The remainder of the collection were free from ectoparasites.

Observations are being made on the development of the floating water lettuce, *Pistia stratiotes,* to determine the rapidity of growth with a view of discovering facts of possible value in the wholesale destruction of this plant, if this should be undertaken in the future to eliminate the breeding of *Mansonia titillans.*

Collections of mosquito larvæ were secured at the laboratory whenever possible from all available sources. These were bred out, and specimens of the larvæ, pupæ, and adult mosquitoes preserved for the collection. This work is being carried out with a view of determining the different species of mosquitoes to be found in the Canal Zone. A good-sized collection has been secured up to date, and undoubtedly the coming dry season will yield more new species. An annotated list of the different species will be put out at a later date.

Colon Hospital.

The routine work was carried on in the old hospital buildings until May 15, 1916. Since May 16, 1916, the new hospital has been occupied. All of the old hospital buildings proper have been torn down and removed except the morgue, chapel, stable, one old storehouse, old ward A, operating pavilion, and the nurses' section of the old hospital buildings, which is still occupied by the nurses

as their home. Estimates have been submitted for a new nurses' home, which it is expected will be built the present year.

The new concrete hospital and storehouse have, after eight months' trial, been found very satisfactory.

The quarters for silver married employees have been moved and are now placed along Second Street. House No. 324, now occupied by doctors and druggists of the hospital and quarantine employees, has also been placed along Second Street in line with the silver married quarters. The new four-family concrete house for use of doctors is rapidly nearing completion. It should be ready for occupancy in less than a month.

Work is expected to begin soon on the new concrete garage and morgue.

The auto ambulance has been in operation for several weeks and is rendering excellent service.

The professional work of this hospital has been carried on at a high standard. The work is particularly exacting for physicians and nurses on account of the large amount of emergency surgery, which requires attention at irregular hours.

Detailed statistics are shown in Tables VII, XIII, and XV.

Palo Seco Leper Asylum.

A new one story building, 28 by 72 feet, containing six rooms, each 12 by 16 feet, with bathroom and toilets and front and rear porches, was completed during the year. All work with the exception of the installing of electric lights and plumbing was done with patient labor under the supervision of the superintendent. Another building of the same dimensions containing six rooms, two bathrooms, and two toilets was at the close of the year about 50 per cent completed. The buildings will be used as quarters for male patients and will relieve the present congested condition.

Male patients formerly living in building No. 12 on the hill to the west of the hospital grounds proper have been transferred to the new building, and building No. 12 will be repaired and painted and used as quarters for the male employees.

Building No. 5 was dismantled during the year by patient labor and rebuilt on a new site to the west of the hospital grounds proper.

Telephone connection with Balboa exchange was completed during the year, which greatly facilitates the transaction of business.

The water supply for the asylum, which came from a well within the hospital grounds, began to fail to furnish the required supply about the middle of July. It was decided to sink another well farther back on higher elevation. Work was completed by the municipal engineers in September, and an ample supply of good water was found at the depth of 147 feet. Installation of the pump and connections was completed the latter part of December.

Due to the severe force of the surf on the southwest end of the beach, the tile sewer line was broken during the year, necessitating a new line of 8-inch wrought iron, extending 960 feet from the end of the old line, running to the southwest of the asylum and terminating beyond the last reef, which was installed by the municipal

engineering department. One hundred and thirty-eight feet of tile sewer was laid, connecting buildings Nos. 5 and 12 with the main line.

A dinghy type boat, 18 feet long, and two Evinrude motors were purchased and put in use carrying supplies to and from Balboa, eliminating the great expense of launch service.

A new survey of the reservation was made during the year by the fortification department, and a portion of the reservation to the west of the asylum proper, next to the cemetery, was turned over to that department.

During the year there were 17 admissions and 9 deaths, with 66 patients remaining in the institution at the end of the year. The average number of patients constantly cared for during the year was 62.81.

At the close of the year 49, or 74 per cent of the patients, are taking chaulmoogra oil. Marked improvement in a number of cases is shown and accurate records of the results of the treatment are being kept.

Motion-picture shows were given weekly during the year, the reels being furnished the asylum by the bureau of clubhouses and playgrounds. At these entertainments ice cream and cake are served to the patients.

Santo Tomas Hospital.

The number of patients treated in hospital was approximately 500 less than for the preceding year, the actual figures 11,282 for 1916 as against 11,778 for 1915. The hospital is taxed to the limit of its accommodations at all times. Very creditable work is being done in all departments.

The necessity for a separate hospital for tuberculosis patients was commented on in the last calendar year report. The matter was taken up with the Panama Government, but due to lack of funds nothing was accomplished. The Panama Government has now agreed to reconstruct certain old buildings in the hospital grounds, which will increase the total bed capacity and provide an open-air roof ward for tubercular patients and better wards for isolation of contagious diseases. This will relieve the immediate situation but a separate institution for tubercular patients is the only satisfactory solution of the overcrowding problem of this hospital.

Detailed statistics are shown in Table VII.

District Dispensaries.

Five line dispensaries have been maintained throughout the year.

The stations having the highest admission rates for malaria were Gatun and Cristobal, with an average weekly percentage of 0.21 and 0.06, and the lowest, Ancon and Paraiso, with 0.03 each.

1,000 population as compared with 0.12 for the registration area of the United States for 1915.

Diphtheria.—During the year there were 57 cases of this disease in the city, with 6 deaths. This gives a rate of 0.10 per 1,000 population, as compared with 0.16 in the registration area of the United States for 1915. Beginning with the latter part of July, there was a slight increase in the incidence of this disease which continued throughout September, but was well controlled by effective isolation methods, early administration of antitoxin, the holding of patients in quarantine until negative cultures were obtained, and a search for and isolation of bacillus carriers from the infected households.

As a result of this active campaign, there was only one case of this disease reported to the health office in December.

Diarrhea and enteritis (under 2 years of age).—The rate of deaths per 1,000 population in the registration area of the United States in 1915 was 0.72, as compared with the following rates in Panama City: 1914, 4.99; 1915, 5.10; and 1916, 4.59 per 1,000 population.

Vaccination.—The requirement that children present satisfactory evidence of recent successful vaccination before being admitted to the schools of the city was successfully enforced, and a number of the younger children who had not been vaccinated in previous years were vaccinated prior to being admitted to the schools.

An arrangement was made with the department of public instruction of the Republic of Panama whereby a record is kept in all schools of those children vaccinated, and whether successfully or not. It is believed that this will prove of great value in the future.

A total of 1,949 vaccinations were performed by the health office during the year, which included a large number of vaccinations of adults in the district where the cases of smallpox were reported in November.

Bureau of infant hygiene.—This work was started during the month of November, one trained nurse being assigned to the bureau. Her time is divided between clinic work in the hospital and making outside visits to the children in their homes, making inspections as to conditions, giving instructions as to the proper care of the babies, etc.

It is too early to make any very definite reports of this work, but it is believed that by the expiration of the present year a very favorable report of work accomplished can be shown.

The station for this work has been established at Santo Tomas Hospital, at which place the nurse in charge takes histories of children, especially of those born in the institution, examines and weighs them, and makes proper records as to their progress.

Midwives.—The ordinance requiring the registration of midwives was put into effect during the year, and they are now under the supervision of this office. Their applications for registration in the health office must be accompanied by certificates from two registered physicians and a responsible layman. One requirement for certification is that a midwife must have attended no less than 20 cases of labor under the supervision of a responsible physician.

Upon receipt of an application for registration of a midwife, an inspection is made of her premises and equipment, and an examination is given her by the health officer to determine her fitness for the practice of her profession.

The Panama Government has established a school for midwives in the maternity wards of Santo Tomas Hospital, under the direction of the national board of hygiene of Panama, and practicing midwives who hold a diploma from that school are registered in the health office without further examination.

GENERAL SANITATION.

The routine work of this class was carried on throughout the year as effectively and with as little expense as possible. The number of districts in which the city is divided for this class of work remains the same, i. e., four, each in charge of an experienced sanitary inspector, with a small gang of laborers, and for the largest district the inspector is assisted by a competent foreman. The work consists of routine house and patio inspections, in search of the breeding of domestic mosquitoes, the abatement and prevention of nuisances of all kinds, cooperating with the building inspector in seeing that all repairs or construction of buildings in their districts is carried on strictly in accordance with the building regulations, particular attention being paid to rat-proofing features.

Stables.—The extensions to the Panama Railroad stables were completed, and this has provided much needed stall space, making it possible to close up any dirty or ill-kept stables which have not complied with the sanitary regulations governing such establishments, although they have had more than two years' time in which to comply with these regulations.

The new stables pay particular attention to the rat-proofing features, and every care is taken to avoid any fly propagation.

Disposal of manure.—The sanitary regulations provide that all manure from each stable shall be removed at least once in 24 hours, and disposed of as may be indicated by the health officer. It is further provided that when being carried away it shall be done in wagons so protected as to render it inaccessible to flies.

This manure is carried to the public open-air dumps and there stored in large piles or mounds, approximating 10 by 20 by 6 feet high. The manure is then covered with rubbish, such as paper, shavings, light wood refuse, and other inflammable materials and then ignited.

A thorough charring of the outer surface of the mounds results, the ash of which is very unattractive to adult flies; therefore it is very rare to find any further deposits of eggs or larval development. After standing for five or six weeks, depending on temperature and rainfall, this mound decomposes into a compost, which may then be used for garden fertilizer without liability of the further breeding of flies.

This method of manure treatment to prevent the breeding of flies and at the same time have the manure available for garden fertilizer is considered very efficient and extremely economical, and would doubtless be suitable for many *small cities* which are unable to dis-

pose of their manure completely through incineration. The revenue to be derived from the sale of the compost would offset the expense of the treatment.

Milk and dairies.—Below is a recapitulation of the work performed along this line, from which will be noted that there is a considerable increase in the number of cows reported in the various dairies. This is largely due to the fact that a large number of small dairies, some distance from the city, which were not formerly inspected, have now been included in the work of this division. This has lowered the average rating of the dairies inspected, as the most of these small "bush" dairies consist of a hut in the jungle with one or two cows grazing nearby, the milk of which is handled in the most crude manner.

An endeavor has been made to have a few of the better class of dairies owned by Panamans put in the best sanitary condition, so they may stand as models to other local dairies which have not attained so high a standard.

Advantage has been taken of the dairy at the Corozal farm in the Canal Zone to use that as a model for all the local dairies with very good results.

Dairies licensed		56
Milk vendors licensed		69
Dairies closed by health department		16
Dairies closed by owners		7
New dairies constructed		12
Plans approved for new dairies		18
Cows:		
1914		545
1915		749
1916		1,110
Daily output of milk:		
1914	gallons	312
1915	do	617
1916	do	827
Average dairy score:		
1914		69.7$_{1}$
1915		68.2$_{0}$
1916		61.4$_{9}$

Bakeries, bottling works, candy kitchens, hotels, restaurants, etc.—Regular routine inspections are made of establishments of this class by the food inspector, and the sanitary regulations affecting them are being enforced, resulting in marked improvement in nearly all such places.

Several of the leading bakeries in the city will now compare very favorably over former years, some of them having been practically rebuilt and a marked improvement in their general condition obtained.

The regulation of miscellaneous food peddlers is being enforced and a list kept in the office of all such persons to whom permits have been issued. Their wares offered to the public are required to be covered so as to be protected from flies and dust, and it is hoped that this precaution will, in a measure, safeguard the health of the patrons of these dealers.

Below is a recapitulation of the work performed during the year.

General food inspections.

Month.	Dairies, milk vendors, etc.	Bakeries, candy kitchens, etc.	Bottling works.	Hotels, clubs, restaurants.	Miscellaneous.
January	94	5	3	49	25
February	145	36	.....	22	31
March	35	2	.....	6	12
April	187	5	3	1	71
May	89	13	8	1	39
June	78	117	1	9	84
July	21	53	4	49	40
August	48	47	9	1	34
September	48	12	6	98	206
October	7	26	34	12	108
November	16	124	3	6	71
December	60	23	12	.....	43
Total	826	463	83	254	764

All meat slaughtered locally is subject to inspection and action of the city veterinarian, a Panamanian official. The services of this office have been at his disposal when desired.

Building inspection—Construction and repair.—There has been a general increase in activity in this line of work throughout the entire city, the prevailing type of building being of frame construction.

Considerable improvement is noted in the type of tenement house, particularly as to light and ventilation, and the floor space of the rooms. Property owners find that it is advantageous to have large, airy, well-lighted rooms in order to retain their tenants.

As already mentioned, the district inspectors cooperate with the building inspector, a total average of about 1,000 inspections per week being made by all of the inspectors engaged in this work.

Particular attention is paid to the rat-proofing features provided for in the building regulations, great stress being laid on the proper construction and repair of roofs and ceilings, in which considerable amount of rat harboring was encountered. Many old buildings have been remodeled or repaired in order to comply with these requirements.

Sanitary nuisances abated.—A total of 4,495 nuisances were abated during the year by the inspectors. These consisted principally of defects in plumbing, floors, pavements, etc., noted by the district inspectors in their daily rounds. The notices were served by them, and the work checked up by them subsequently.

During the year it was necessary to clean 56 properties for private parties, the work being performed for them at their expense.

In connection with this work it was necessary to impose 121 fines on delinquents for various causes, the total amount imposed being $905, less two fines of $25 that were remitted.

Street cleaning and sprinkling.—The city is now divided into three districts for the facilitation of this work, each district being in charge of a foreman and gang of push-cart street sweepers. At

present the entire city is cleaned through what is known as the "picket system," which is found to be the most efficient and economical.

In general, each sweeper is assigned a definite street area and his foreman holds him responsible for the cleanliness of his area. By frequent inspections on the part of the foremen, as well as the inspector in charge of that branch of the work, the street sweepers are kept up to the mark in their work, and their sections are kept fairly clean at all times.

With the installation of a large number of macadam-asphalt streets by the municipal engineering division during the past year, the work of street cleaning and sprinkling has been much facilitated, as this type of street in the Tropics is very much easier to clean, requires less sprinkling to keep down dust, and does not afford anything like as many nuisances as the old type of macadam street.

Garbage collection and disposal.—This service has been carried on as efficiently and economically as possible during the year. The entire work is now done during the day, whereas formerly it was partly done at night and partly during the day, thus requiring extra gangs and foremen on account of the division of the work.

The collection is begun in the early morning hours at a point farthes; from the dump, working always in collecting toward the dump; thus as the day advances the haul becomes less each trip.

The service has been extended to include the exposition grounds, which adds a good deal to the territory covered by this work.

The present means of disposal is open-air burning, which is as effective as it is possible to be for a climate of torrential rains. The garbage is piled in long windrows, which favors the quick running off of water after the heavy rains and also allows more wind action on the fires, preventing their extinction as much as formerly.

Considerable filling has been accomplished with refuse, ashes, etc., from the dumps, and some very bad swampy areas have been eliminated near by.

A modern incinerating plant is being constructed for the incineration of all garbage produced in Panama and the terminal Zone towns on the Pacific side. The erection of this plant will fill a long-felt want and aid in the elimination of many grave nuisances which are encountered at the present dump.

During the year a total of 891 garbage cans and pails were sold to the residents of Panama, covers being provided for them by this office.

SANITATION—COLON.

The present organization of the health office, Colon-Cristobal, remains the same as last year. One sanitary inspector each is assigned to four districts; one has charge of the street-cleaning and garbage collection, and one of the food inspection, restaurants, hotels, etc.

In each of the four districts the inspector has a small gang of laborers under him who eliminate mosquito-breeding places and all rubbish, clean premises, go through and examine every house at least twice a week.

Mosquito control.—The elimination of mosquito breeding in Colon and Cristobal has been so thoroughly done that the end of the year saw the complete cessation of it, and the malarial rate is the lowest in the history of the Isthmus. The dry filling of the swamp in East Colon for the purpose of erecting new gold quarters there and the new storm sewer on G Street will practically end all danger of mosquito breeding there when the work is completed.

In Mount Hope district, where breeding has always been considerable and a source of danger to the whole Atlantic terminal, extensive work of a permanent nature has gone on this year with marked results. Large areas of swampy land have been filled both by dry and hydraulic filling, and others drained.

One of the results of this has been that the highest malarial rate for 1916 was two-thirds lower than that of 1915; while the rate in 1916 touched zero and remained there for some time, five times as often as in 1915.

School inspection.—The schools in the district are periodically inspected, the dispensary staff making the annual physical examination of all pupils in the Zone schools, and the health office conducting monthly inspections both of public and private schools.

All children not protected against smallpox were vaccinated, and no epidemic has interfered with the work of the schools in the current year.

The health office has enjoyed the hearty cooperation of the teaching staff, which has been of special value in reporting notifiable diseases.

Food inspection.—The work of food inspection has been maintained and conditions have been improved. A new concrete hotel in Cristobal is nearing completion, whose construction was undertaken largely at the initiative of the health office and because the old building had become eminently unsatisfactory.

Three new concrete hotels have been opened in Colon and others renovated and improved.

The milk supply of the city is regularly inspected, and no cases of disease have been traced to that source.

The health department has been active in getting rid of a threatened invasion of anthrax here and has secured a thorough system of inspection to prevent the sale of infected meat.

Standard-type fowl coops are in use in Colon, and no small animals for slaughter are allowed in private premises.

All bakers are subject to physical examination and must have licenses. All bakeries have been renovated and improved notably.

The pure-food work will be facilitated by the contemplated concentration of the native trade at one place on Folks River in East Colon, where a concrete pier has been erected by the Panama Railroad for their use, with a view of controlling the entrance of food products through this channel.

Nuisances.—The rebuilding of the large burned area of Colon in concrete structures has tended greatly to reduce fly and rat infestation.

Flies have been reduced to a minimum, due largely to the use of new manure-curing pits and to the strict enforcement of the rules for the segregation of horses and other animals.

The demolition of a number of old buildings along the water front and the filling in of holes in the coral rocks drove the rats into the city where they are caught in traps, two men being detailed for this work all of the time. As many as 31 rats have been caught in one day by one man.

In abating nuisances around premises and in the enforcement of the sanitary laws the police departments both of the Canal Zone and municipality of Colon have cooperated with the health office in a very satisfactory manner. In Colon there have been special details of policemen with the sanitary inspectors with good results.

Garbage and rubbish collection.—This work has gone on as in previous years, except that increased rapidity of collection has been noted as a result of the districting of the city and the shorter periods of routine inspection.

The use of the new concrete and metal stands has resulted in improved conditions and they are now installed in a majority of cases, the old wooden ones being retired as fast as they can be condemned.

A barge for garbage collection and dumping into the sea of the garbage from the docks is being built and will soon be in commission.

Street cleaning.—This is effected as formerly by hand labor. Some of the most used streets have been oiled to keep down the dust in the dry months.

The macadam is being replaced with concrete on Bolivar Street and adjoining side streets, which will facilitate the street cleaning and permit of the use of street sweepers, an improvement over the present system.

Municipal engineer changes.—The main sewer from Colon was changed to empty into the bay instead of Folks River, this change being on account of the building of a residential section on Folks River beach. A new pumping station and sump is being built near this new residential site.

A large storm sewer is being constructed along G Street to run from Ninth Street to the beach in front of Colon Hospital. The sewer system at Battery Morgan was extended and consolidated, owing to the building of military barracks there.

In general the rebuilding of Colon since the two recent fires is resulting in vastly improved conditions affecting the general health and appearance of the city.

QUARANTINE DIVISION.

A résumé of the quarantine operations for the year 1916 shows that the activities of this division were concerned, as usual, with the safeguarding of the Isthmus against the introduction of quarantinable disease. During the time of the prevalence of infantile paralysis in the States very careful inspection of incoming passengers was made, and in the cases of all under the age of 16 showing an elevation of temperature measures of isolation were carried out until the cause was determined. In addition to the functions of quarantine, the conduct of immigration has required close attention

on the part of the quarantine division, particularly since the passenger boats engaged in the west coast traffic have made Cristobal their terminal port, thereby centering the immigration work to a very large extent on the Atlantic side. The matter of preventing the landing of undesirables on the Isthmus has been carried out to a very successful degree, and our ports are at the present time freer of roustabouts and undesirables than probably at any time previous.

Along the first part of the year the yellow-fever situation on the west coast of Colombia in Buenaventura and vicinity, was still looked on with some apprehension, due to the outbreak of this disease occurring in the latter part of 1915. The sanitary measures, however, carried out by the commission from the Canal Zone, have evidently had good results, and no cases have been reported from this locality for some time. It has, however, been considered necessary to maintain protective quarantine against all Colombian ports. On the Atlantic side yellow fever has been reported on the islands of Barbados and Martinique; because of the fact, however, that ships rarely reach the Isthmus from these ports under six days, the matter has caused us no great concern.

Bubonic plague has shown no decrease in its distribution in South America during the year of this report, but on the contrary has probably extended to localities previously considered noninfected or at most only in the suspicious class. One marked increase of this disease occurred in the vicinity of Paita, Peru, and an extension of the disease northward from Guayaquil, Ecuador, has taken place, involving the country districts in the vicinity of Manta and Bahia, Ecuador; these ports are a relatively short distance below the Colombian border and the prevalence of plague in these vicinities can only mean an extension of the disease northward and closer toward zone ports. In view of the fact that plague is so generally distributed, along the west coast of South America particularly, we have endeavored to tighten and improve our antiplague measures with reference to the ships in zone ports. Our local measures of breasting off, rat guarding, raising of gangways at night, fumigation, etc., have been watched very closely because the potential danger to the zone from the standpoint of rat introduction is much greater than through the agencies of human transmission. To this end mechanical cleanliness and improved sanitary conditions aboard ship have received careful attention, and the value of all these measures emphasized to the local shipping interests.

General measures toward the improvement of our quarantine grounds and buildings have been given attention, and at the present time the two quarantine stations are in a state of fairly good equipment.

The inspection of cattle, both quarantine and ante and post mortem, has required very careful attention, due to the occurrence of anthrax at the end of the last dry season. Cases of this disease occurred among the cattle pastured near Colon in February, March, April, and to some extent a little later. The experience in 1914 and 1915 with reference to anthrax led us to expect a recurrence of this disease before the dry season was over. Further deaths from anthrax also occurred during the month of November, due, in all

probability, to overcrowding of infected pastures. The measures, however, outlined by the health department in the campaign directed against anthrax have resulted in the absence of new cases of this disease among cattle on the zone and has been due largely to extension of pasture lands in noninfected territory, care in the matter of prevention of overcrowding of old pastures which are considered infected, placing of vaccinated cattle only on old infected areas, and the reduction of the total number of cattle pastured on the zone. A most careful method of procedure was carried out with regard to ante and post mortem inspection, and it is believed that cattle taken for slaughter are safeguarded in this respect to a most careful degreee.

During the year the following ante and post mortem inspections were made by the veterinarians of the health department for the supply department: Cattle, 10,241; hogs, 20; sheep, 2. For outside interests: Hogs, 13. Quarantine inspections were made as follows: For the supply department 12,215 cattle, 20 hogs; for outside interests 1,048 cattle, 603 hogs.

ADMISSION RATE PER 1,000 EMPLOYEES.

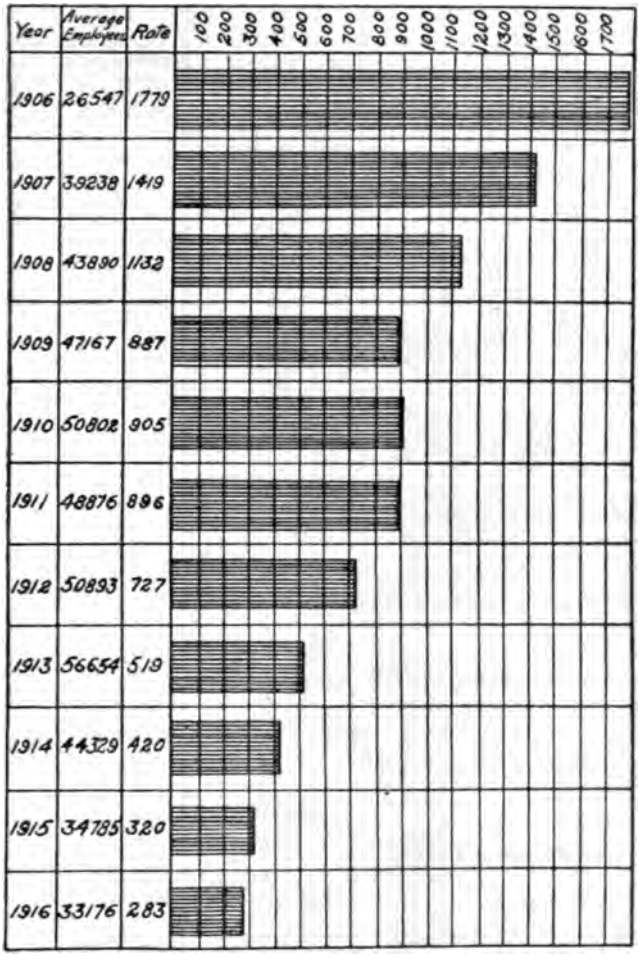

CHART NO. I.

DEATH RATE PER 1,000 EMPLOYEES.

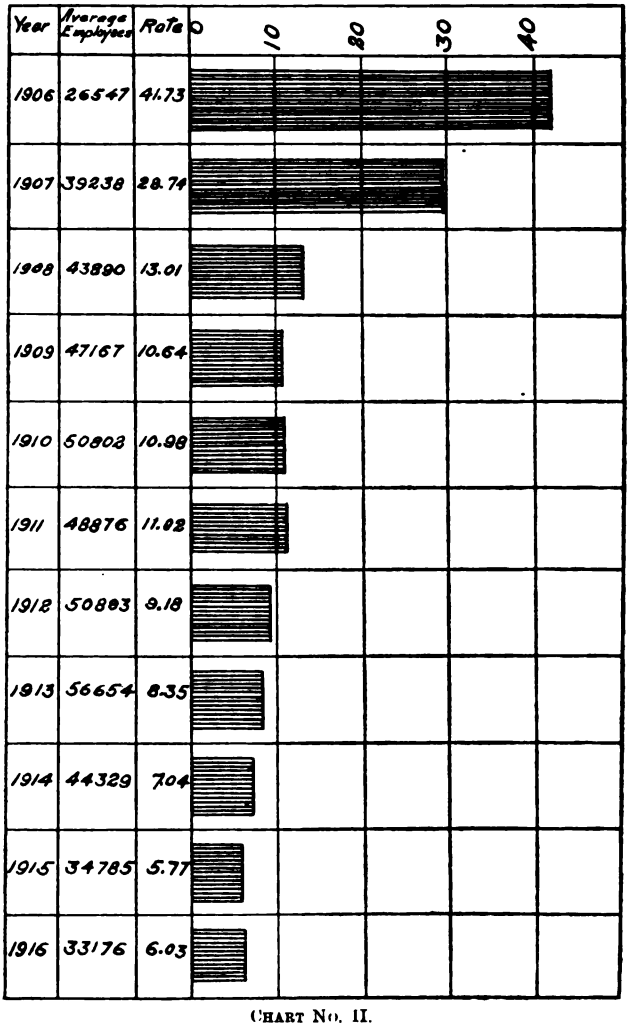

CHART NO. II.

NONEFFECTIVE RATE PER 1,000 EMPLOYEES.

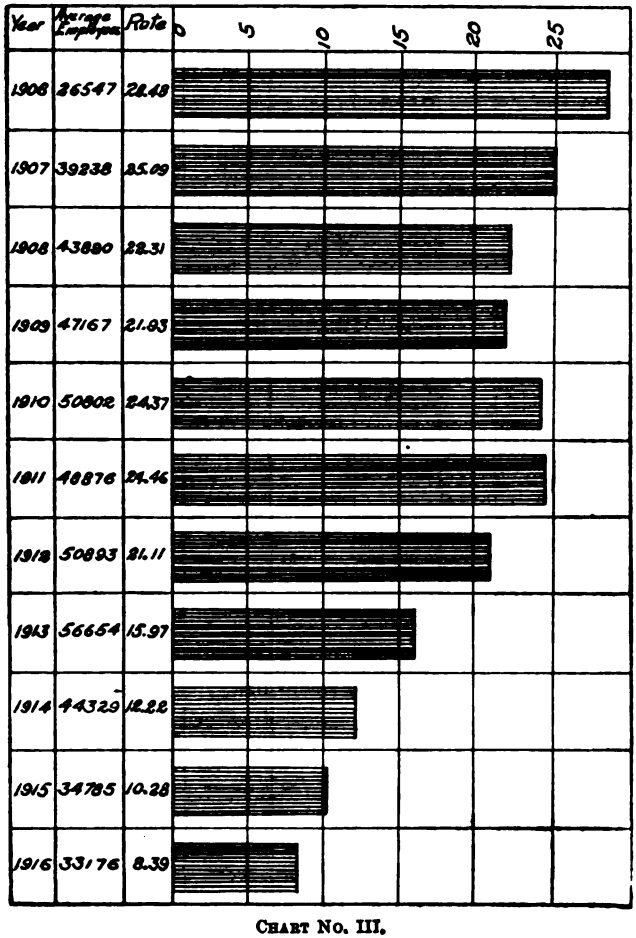

CHART NO. III.

MALARIAL FEVER
ADMISSION RATE PER 1,000 EMPLOYEES

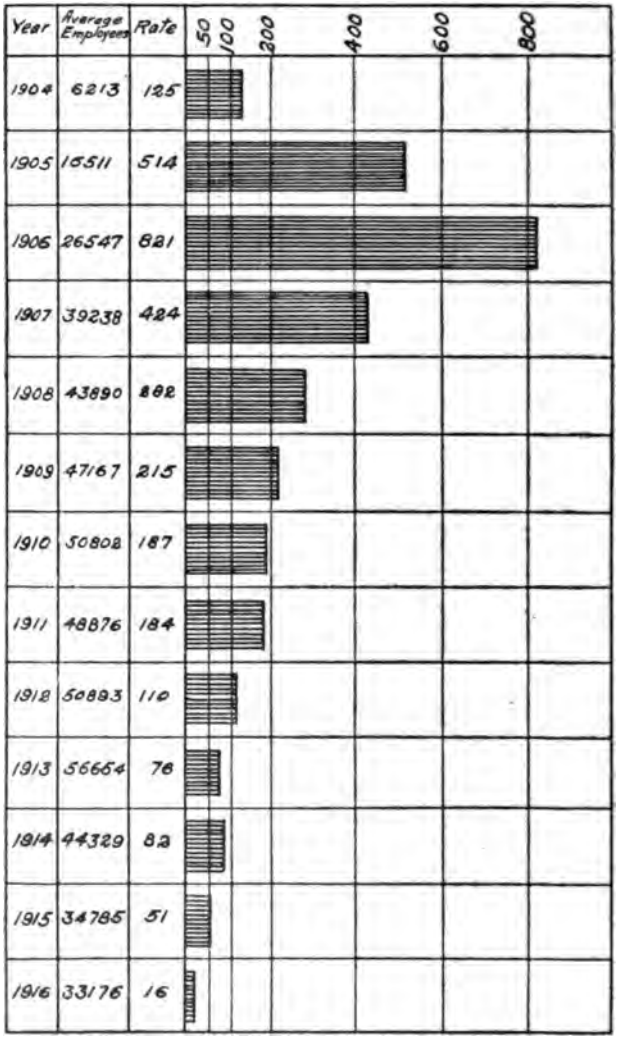

CHART No. IV.

MALARIAL FEVER
DEATH RATE PER 1,000 EMPLOYEES

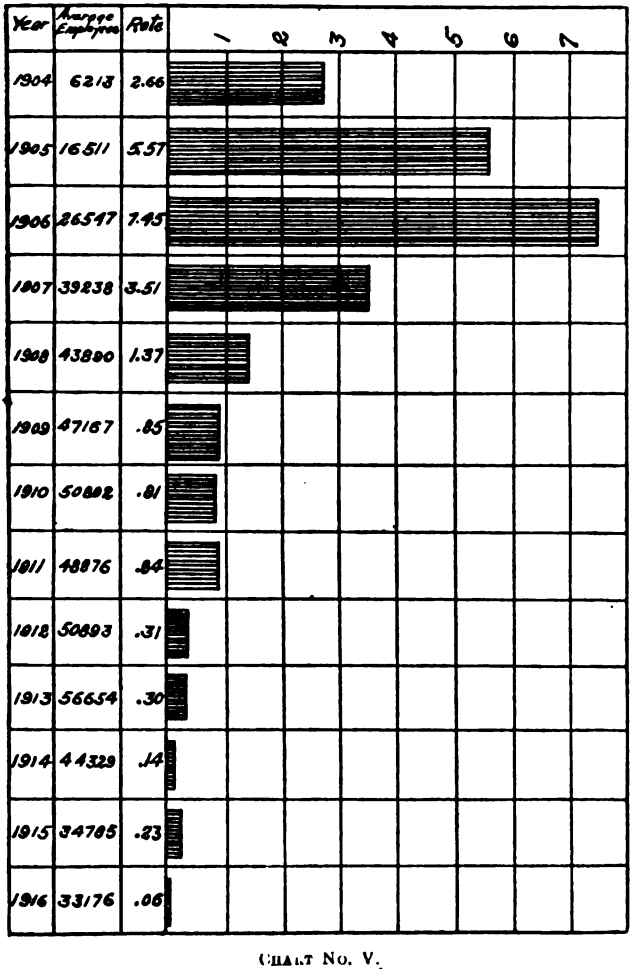

CHART No. V.

MALARIAL FEVER
DEATH RATE PER 1,000 POPULATION IN THE
CANAL ZONE AND THE CITIES OF PANAMA AND COLON
EMPLOYEES AND NONEMPLOYEES.

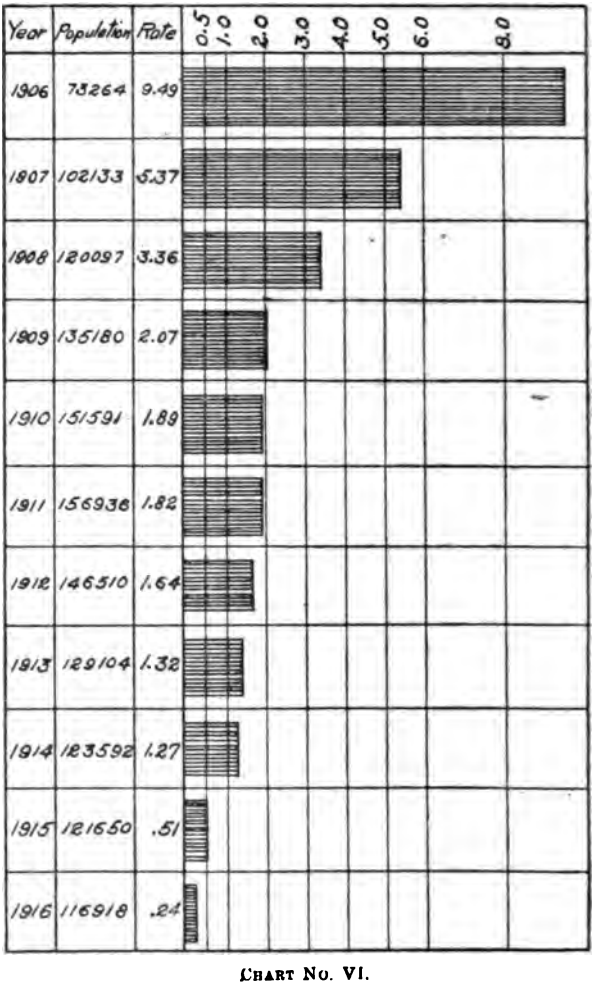

CHART NO. VI.

TABLE I.—ADMISSIONS, DEATHS, AND NONEFFECTIVE RATES FOR EMPLOYEES.

ABSOLUTE NUMBERS.

Color.	Average number of employees.	Admissions to hospitals.			Deaths.			Noneffective from sickness.[1]	
		Total.	Disease.	External causes.	Total.	Disease.	External causes.	Days treated.	Constantly noneffective.
Year 1916:									
White	4,552	1,473	1,217	256	24	15	9	29,513	80.86
Colored	28,624	3,186	2,224	962	176	137	39	82,116	224.36
Total	33,176	4,659	3,441	1,218	200	152	48	111,629	305.22
Year 1915:									
White	4,719	1,868	1,572	296	26	15	11	34,123	93.49
Colored	30,066	4,608	3,431	1,177	175	126	49	96,400	264.11
Total	34,785	6,476	5,003	1,473	201	141	60	130,523	357.60

PROPORTIONATE NUMBERS.[2]

Year 1916:									
White	4,552	323.59	267.35	56.23	5.27	3.29	1.98	.....	17.76
Colored	28,624	111.31	77.70	33.61	6.15	4.79	1.36	.....	7.84
Total	33,176	140.43	103.72	36.71	6.03	4.58	1.45	.....	9.20
Year 1915:									
White	4,719	395.85	333.12	62.73	5.51	3.18	2.33	.....	19.81
Colored	30,066	153.26	114.11	39.15	5.82	4.19	1.63	.....	8.78
Total	34,785	186.17	143.82	42.35	5.77	4.05	1.72	.....	10.28

[1] Includes both hospitals and quarters. [2] Annual average per 1,000.

DEATHS OF RESIDENTS OF THE CITIES OF PANAMA, COLON, AND THE CANAL ZONE.

Place.	Average population.	Deaths.			Annual average per 1,000.		
		Total.	Disease.	External causes.	Total.	Disease.	External causes.
Year 1916:							
Panama	60,778	1,765	1,702	63	29.04	28.00	1.04
Colon	24,693	696	662	34	28.19	26.81	1.38
Canal Zone	31,447	343	290	53	10.91	9.22	1.69
Total	116,918	2,804	2,654	150	23.98	22.70	1.28
Year 1915:							
Panama	60,373	1,810	1,749	61	29.98	28.97	1.01
Colon	29,331	640	604	36	21.82	20.59	1.23
Canal Zone	31,946	410	361	49	12.83	11.30	1.53
Total	121,650	2,860	2,714	146	23.51	22.31	1.20

TABLE II.—DEATHS BY AGE, COLOR, AND SEX.

	White.			Colored.			Yellow.			Total.		
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.
Under 1 year	55	28	83	436	368	804	5	6	11	496	402	898
1 to 4 years	15	16	31	189	148	337	1	3	4	205	167	372
5 to 10 years	4	6	10	24	19	43	1	1	2	29	26	55
11 to 20 years	4	5	9	43	52	95	.....	1	1	47	58	105
21 to 30 years	38	14	52	252	174	426	5	1	6	295	189	484
31 to 40 years	44	11	55	191	132	323	10	.....	10	245	143	388
41 to 50 years	23	10	33	123	69	192	10	.....	10	156	79	235
51 to 60 years	22	4	26	73	41	114	5	.....	5	100	45	145
61 to 70 years	16	4	20	24	19	43	3	1	4	43	24	67
71 to 80 years	4	4	8	10	10	20	2	.....	2	16	14	30
81 to 90 years	.....	3	3	2	7	9	1	.....	1	3	10	13
91 to 100 years	.....	.....	.....	1	.....	1	.....	.....	.....	1	.....	1
100 to 110 years	.....	.....	.....	1	.....	1	.....	.....	.....	1	.....	1
Not stated	.....	.....	.....	9	.....	9	1	.....	1	10	.....	10
Total	225	105	330	1,378	1,039	2,417	44	13	57	1,646	1,158	2,804

TABLE III.—DEATHS BY NATIONALITY.

Nation.	Employees.	Nonemployees.	Total.
Antigua	3	26	29
Antilles		3	3
Argentina		1	1
Austria		3	3
Bahama Islands		1	1
Barbados	52	411	463
Bermuda Island		1	1
Bolivia		1	1
Canary Islands	1		1
Chile	1	2	3
China		55	55
Colombia	5	152	157
Costa Rica	3	6	9
Cuba		2	2
Curacao		3	3
Demerara	1	11	12
Dominica	2	2	4
Ecuador		4	4
England		7	7
Fortune Islands	1	2	3
France		11	11
Germany		2	2
Greece	1	5	6
Grenada	2	33	35
Guatemala		2	2
Guadeloupe	3	18	21
British Guiana	1	2	3
Hayti	1	6	7
Honduras	1	2	3
Holland		1	1
India		4	4
Italy	1	25	26
Jamaica	68	714	782
Japan		2	2
Martinique	2	60	62
Mexico		3	3
Montserrat	7	13	20
Nassau		6	6
Nevis	1	1	2
Nicaragua		5	5
Norway		2	2
Panama	7	749	756
Peru	3	16	19
Philippines		1	1
Porto Rico		1	1
Portugal		4	4
Russia	1	2	3
Scotland		1	1
St. Kitts	1	3	4
St. Lucia	5	57	62
St. Thomas		7	7
St. Vincent	5	17	22
Spain	1	34	35
Tobogo		1	1
Trinidad	2	27	29
Turkey		1	1
United States	14	50	64
Venezuela	1	9	10
West Indies		1	1
Unknown	3	13	16
Total	200	2,604	2,804

TABLE IV.—CAUSES OF DEATHS OF EMPLOYEES.

Cause of death.	White.	Colored.	Total.
Alcoholism, acute and chronic	2	.....	2
Aneurysm	1	2	3
Cerebral hemorrhage	2	7	9
Appendicitis	.....	1	1
Brain, softening of	.....	2	2
Carbuncle	.....	2	2
Cardio-renal disease	.....	1	1
Cellulitis, streptococcic	1	.....	1
Dysentery, bacillary	.....	1	1
Dysentery, unclassified	.....	1	1
Diseases of the urethra, urinary abscess, etc	.....	1	1
Endocarditis, acute and chronic	.....	2	2
Epithelioma of œsophagus	.....	1	1
Diseases of the arteries	.....	2	2
Fever, malarial, estivoautumnal	.....	2	2
Fever, typhoid	.....	3	3
Heart, organic diseases of	1	11	12
Hodgkin's disease	.....	1	1
Insane, general paralysis of	.....	1	1
Manic depressive psychosis	.....	1	1
Nephritis, chronic	.....	20	20
Pellagra	.....	1	1
Peritonitis, simple	1	1	2
Pneumonia, lobar	3	28	31
Pyelitis	.....	1	1
Pyæmia, streptococcic	.....	2	2
Syphilis, tertiary	.....	2	2
Syphilis, secondary	.....	1	1
Sarcoma of left hip and other structures	.....	1	1
Tuberculosis, abdominal	.....	1	1
Tuberculosis, disseminated	2	14	16
Tuberculosis, miliary	.....	2	2
Tuberculosis, pulmonary	2	14	16
Tuberculosis, Psoas muscle and lymph nodes	.....	1	1
Uremia	.....	2	2
Ulcer, duodenal	.....	3	3
Urethra, stricture of	.....	1	1
External causes.			
Railroad traumatism	2	.....	2
Accidental traumatism, various	2	15	17
Drowning, accidental	3	18	21
Dynamite explosions	.....	2	2
Electrocution, accidental	.....	2	2
Suicide	1	.....	1
Homicide by firearms	1	.....	1
Other external violence	.....	2	2
Total	24	176	200

E V.—DEATH RATES AMONG AMERICANS ON THE ZONE.

	Average number.	Causes of death.	Number of deaths.	Annual average per 1,000.
nployees from the States.	4,199	Disease	7	1.67
		External causes	7	1.67
		All causes	14	3.33
omen and children United States.	3,575	Disease	14	3.81
		External causes	1	.27
		All causes	15	4.08
nployees and their from the United	7,774	Disease	21	2.70
		External causes	8	1.03
		All causes	29	3.73
icans on the Canal	15,693	Disease	29	1.85
		External causes	20	1.27
		All causes	49	3.12

es employees and their families and officers and enlisted men of the United ny stationed on the Isthmus.

[.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOY- ND NONEMPLOYEES) AND MILITARY AND PLACES WHERE EABLE.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
I. *General diseases.*				
ever	3	1	4	8
ever:				
autumnal	4	5	8	17
m	2		1	3
termined		1		1
al	2			2
xia	1	1		2
	1			1
	1			1
	2	3		5
cough	3	3		6
a and croup	6	4	2	12
		5		5
	3			3
nebic	1			1
ary		2		2
ssified	1	1	1	3
s	1			1
			1	1
infection and septicemia	7	1		8
	2	2		4
ia	7	2	2	11
	9	1		10
	25	15	7	47
	8	1	2	11
osis of the lungs	242	70	22	334
liary tuberculosis	10	1	2	13
ous meningitis	10	3	1	14
al tuberculosis	4	1		5
ease		1		1
osis of other organs	3		1	4
ated tuberculosis	44	15	15	74
		1		1

TABLE VI.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOYEES AND NONEMPLOYEES) AND MILITARY AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
I. *General diseases*—Continued.				
Syphilis:				
Secondary	1	.....	.....	1
Tertiary	11	2	.....	13
Hereditary	12	3	.....	15
Period not stated	5	2	.....	7
Cancer and other malignant tumors of the—				
Buccal cavity	7	2	.....	9
Stomach and liver	6	2	1	9
Peritoneum, intestines, rectum	3	2	1	6
Female genital organs	8	.....	.....	8
Breast	1	.....	.....	1
Other organs and of organs not specified	9	5	1	15
Acute articular rheumatism	2	.....	.....	2
Chronic rheumatism and gout	1	.....	.....	1
Scurvy	1	.....	.....	1
Diabetes	1	1	1	3
Hodgkin's disease	.....	1	.....	1
Anemia:				
Primary, pernicious	1	1	.....	2
Secondary, cause not determined	3	1	.....	4
Other general diseases	3	.....	.....	3
Alcoholism:				
Acute or chronic	3	2	2	7
Acute	2	1	.....	3
Chronic	3	.....	1	4
II.—*Diseases of the nervous system and of the organs of special sense.*				
Encephalitis	1	.....	1	2
Simple meningitis	9	.....	1	10
Cerebrospinal fever	2	.....	.....	2
Pneumococcus meningitis	7	.....	2	9
Locomotor ataxia	3	.....	.....	3
Other diseases of the spinal cord	1	.....	2	3
Cerebral hemorrhage, apoplexy	22	16	6	44
Softening of the brain	2	.....	2	4
Paralysis without specified cause	2	1	.....	3
General paralysis of the insane	2	.....	2	4
Other forms of mental alienation	2	.....	1	3
Epilepsy	5	8	1	14
Convulsions (nonpuerperal) (5 years and over)	.....	.....	1	1
Convulsions of infants (under 5 years of age)	4	3	5	12
Neuritis	.....	.....	1	1
Other diseases of the nervous system	2	2	1	5
Tumor of the brain	1	.....	.....	1
Diseases of the ears	3	.....	.....	3
III.—*Diseases of the circulatory system.*				
Pericarditis	6	1	.....	7
Acute endocarditis	10	1	2	13
Malignant endocarditis	2	1	.....	3
Organic diseases of the heart	68	38	17	123
Diseases of the arteries, atheroma, aneurysm, etc.	3	.....	.....	3
Aneurysm	6	.....	3	9
Arteriosclerosis	20	5	1	26
Embolism and thrombosis	2	2	2	6

TABLE VI.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOYEES AND NONEMPLOYEES) AND MILITARY AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
III.—*Diseases of the circulatory system*—Contd.				
Diseases of the lymphatic system (lymphangitis, etc.)	3	.....	.....	3
Hemorrhage; other diseases of the circulatory system	3	.....	.....	3
IV.—*Diseases of the respiratory system.*				
Acute bronchitis	41	39	4	84
Chronic bronchitis	8	22	1	31
Broncho-pneumonia	132	70	27	229
Pneumonia (unqualified)	29	8	1	38
Lobar pneumonia	48	39	19	106
Pleurisy	2	.....	.....	2
Empyema	2	2	.....	4
Pulmonary congestion, pulmonary apoplexy	7	2	.....	9
Gangrene of the lungs	2	.....	.....	2
Asthma	5	.....	1	6
Pulmonary emphysema	1	.....	.....	1
Other diseases of the respiratory system	3	.....	.....	3
Abscess of lungs	.....	1	1	2
V.—*Diseases of the digestive system.*				
Diseases of the mouth and annexa	1	.....	.....	1
Diseases of the pharynx	.....	1	.....	1
Diseases of the esophagus	2	.....	.....	2
Ulcer of the stomach	1	.....	.....	1
Other diseases of the stomach (cancer excepted)	1	.....	.....	1
Acute gastritis	2	1	.....	3
Chronic gastritis	.....	3	.....	3
Acute indigestion	1	3	.....	4
Diarrhea and enteritis (under 2 years)	279	37	17	333
Colitis	45	4	5	54
Diarrhea and enteritis (2 years and o er)	16	6	3	25
Colitis	2	1	.....	3
Ankylostomiasis	2	.....	.....	2
Intestinal parasites	.....	1	.....	1
Appendicitis and typhlitis	1	.....	.....	1
Acute appendicitis	1	1	.....	2
Chronic appendicitis	.....	1	1	2
Hernia, intestinal obstructions	7	2	1	10
Intestinal obstruction	7	.....	2	9
Other diseases of the intestines	3	1	2	6
Duodenal ulcer	3	.....	2	5
Cirrhosis of the liver	8	2	1	11
Other diseases of the liver	1	1	.....	2
Abscess of liver (unqualified)	7	.....	.....	7
Cholecystitis	2	.....	.....	2
Simple peritonitis (nonpuerperal)	11	5	1	17
Other diseases of the digestive system (cancer and tuberculosis excepted)	2	.....	.....	2
VI.—*Nonvenereal diseases of the genito-urinary system and annexa.*				
Acute nephritis	32	13	5	49
Bright's disease (chronic nephritis)	74	68	17	159
Other diseases of the kidney and annexa	2	6	3	11
Pyelonephrosis	3	2	2	7

TABLE VI.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOYEES AND NONEMPLOYEES) AND MILITARY AND PLACES WHERE CHARGEABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total
VI.—*Nonvenereal diseases of the genito-urinary system and annexa*—Continued.				
Diseases of the bladder	1			
Cystitis	3		1	
Diseases of the urethra, urinary abscess, etc	1		2	
Stricture of the urethra, nonvenereal	2		2	
Other diseases of the uterus	1			
Salpingitis and other diseases of the female genital organs	2	1		1
VII.—*The puerperal state.*				
Accidents of pregnancy		1		1
Abortion	1		1	2
Puerperal hemorrhage	5			5
Other accidents of labor	3	1		4
Puerperal septicemia	2	2	3	7
Puerperal albuminuria and convulsions	2	2		4
Eclampsia	3	4	1	8
Following childbirth (not otherwise defined)			1	1
VIII.—*Diseases of the skin and of the cellular tissue.*				
Gangrene	1	1		2
Carbuncle	2	1		3
Mycetoma	1			1
Other diseases of the skin and annexa	1			1
IX.—*Diseases of the bones and of the organs of locomotion.*				
Diseases of the bones (tuberculosis excepted)	2			2
Osteomyelitis	1			1
X.—*Malformations.*				
Congenital malformations (stillbirth not included)	7		1	8
XI.—*Diseases of early infancy.*				
Newborn child	1	1	3	5
Congenital debility, icterus, and sclerema	3	2	3	8
Premature birth	44	8	6	58
Congenital debility	23	6	1	30
Atrophy of infants	1	2		3
Malnutrition	49	12	15	76
Other causes peculiar to early infancy (including various consequences of labor	19	7	2	28
Lack of care		3		3
XII.—*Old age.*				
Senility	6			6
[illegible] sections produced by external causes.				
[illegible]ing	1	2		3
[illegible]g or strangulation	1	1	1	3
[illegible]ning			1	1
[illegible]rms	6	2		8
[illegible]ng or piercing instruments			1	1

I.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOY-ND NONEMPLOYEES) AND MILITARY AND PLACES WHERE EABLE—Continued.

Diseases.	Panama.	Colon.	Canal Zone.	Total.
fections produced by external causes—Continued.				
te poisonings	2	1	.....	3
ion	2	6	.....	8
nflagration excepted)	5	.....	1	6
l drowning	9	8	23	40
sm by—				
ms	2	1	2	5
.....	5	2	5	12
nes	3	2	.....	5
crushings	7	4	5	16
traumatism	3	.....	3	6
traumatism	.....	.....	3	3
y animals	1	.....	.....	1
(lightning excepted)	1	.....	1	2
by—				
ms	9	3	2	14
ig or piercing instruments	1	1	1	3
means	1	1	2	4
(cause not specified)	.....	.....	2	2
ernal violence	4	1	.....	5
XIV.—*Ill-defined diseases.*				
l organic disease	1	.....	.....	1
leath not specified or ill-defined	41	22	4	67
of undetermined origin	1	1	1	3
al	1,765	696	343	2,804
	230	58	37	325
nd total	1,995	754	380	3,129

TABLE VII.—CONSOLIDATED HOSPITAL REPORT.

	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
HOSPITAL.												
anal employ-	25	117	1,007	1,852	9	58	977	1,764	4	17	42	130
Railroad em-	6	75	142	660	3	33	135	637	....	13	10	52
ay patients	.....	1	2	13	....	3	.....	.....	2	10	....	1
patients	111	48	3,526	1,352	45	126	3,479	1,201	23	17	90	56
atients	13	41	245	317	4	44	240	258	2	33	12	23
al	155	282	4,922	4,194	61	264	4,831	3,860	31	90	154	262

TABLE VII.—CONSOLIDATED HOSPITAL REPORT—Continued.

	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
ANCON HOSPITAL—con.												
Insane department.												
Panama Canal employees	5	10	2	9	....	2	1	2	6	9	....	6
Panama Railroad employees	....	3	....	8	....	2	....	2	....	6	....	1
Panama pay patients	18	165	39	94	5	34	14	22	1	15	37	188
Other pay patients	9	5	31	13	2	6	29	9	2	1	7	2
Charity patients	8	45	7	39	....	7	1	9	1	6	13	62
Total	40	228	79	163	7	51	45	44	10	37	57	259
Grand total	195	510	5,001	4,357	68	315	4,876	3,904	41	127	211	521
Corozal farm.												
Panama Canal employees	11	45	14	45	....	....	14	34	1	2	10	54
Chronic ward.												
Charity patients	....	26	....	26	....	....	....	17	....	11	....	24
COLON HOSPITAL.												
Panama Canal employees	1	5	219	274	....	6	185	216	29	19	6	8
Panama Railroad employees	1	10	105	398	....	27	92	289	13	84	1	8
Panama pay patients	....	1	22	132	3	11	6	23	13	98	....	1
Other pay patients	11	5	365	101	9	7	294	69	61	29	12	1
Charity patients	3	1	41	43	....	2	38	20	5	22	1	....
Total	16	22	752	948	12	53	615	617	121	282	20	18
PALO SECO LEPER ASYLUM.												
Panama Canal employees	....	....	....	4	....	....	....	....	....	4	....	....
Panama pay patients	3	35	....	9	1	5	....	....	....	....	2	39
Charity patients	2	18	....	8	1	2	....	....	....	....	1	24
Total	5	53	....	21	2	7	....	....	....	4	3	63
GRAND TOTALS.												
Panama Canal employees	42	177	1,242	2,184	9	66	1,177	2,016	40	81	58	198
Panama Railroad employees	7	88	217	1,066	3	62	227	928	13	103	11	61
Panama pay patients	21	202	63	248	9	53	20	45	16	123	39	229
Other pay patients	131	58	3,922	1,466	56	139	3,802	1,279	86	47	109	59
Charity patients	26	131	293	433	5	55	279	304	8	72	27	133
Total	227	656	5,767	5,397	82	375	5,505	4,572	163	426	244	680

ABLE VIII.—CONSOLIDATED REPORT OF EMPLOYEES TREATED IN QUARTERS.

Stations.	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
ıcon	5	....	1,238	29	....	....	1,223	25	20	4	....	....
ıboa	3	6	1,107	280	....	....	1,057	174	48	112	5	....
dro Miguel	2	....	158	6	....	....	151	4	9	2	....	....
raiso	1	2	210	55	....	....	195	54	15	2	1	1
mboa	....	....	7	23	....	....	4	21	3	2	....	....
tun	1	2	148	61	....	....	143	56	5	4	1	3
lon	2	11	934	905	....	....	934	899	....	....	2	17
Total	14	21	3,802	1,359	....	....	3,707	1,233	100	126	9	21

CONSOLIDATED REPORT OF DAYS LOST BY EMPLOYEES IN QUARTERS.

Stations.	White.	Colored.	Total.
con	2,399	147	2,546
boa	2,815	729	3,544
ro Miguel	447	18	465
aiso	508	134	642
nboa	25	38	63
un	450	310	760
n	2,523	6,238	8,761
Total	9,167	7,614	16,781

LE IX.—CONSOLIDATED HOSPITAL AND EMPLOYEES TREATED IN QUARTERS REPORT.

	Remaining Jan. 1.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
pitals	227	656	5,767	5,397	82	375	5,505	4,572	163	426	244	680
rters	14	21	3,802	1,359	....	....	3,707	1,233	100	126	9	21
Total	241	677	9,569	6,756	82	375	9,212	5,805	263	552	253	701

JE NUMBER OF EMPLOYEES CONSTANTLY SICK IN HOSPITALS AND QUARTERS.

	White.	Colored.	Total.
l	47.46	187.19	234.65
	8.30	15.60	23.90
er Asylum		.71	.71
	55.76	203.50	259.26
	6.57	.40	6.97
	7.71	2.00	9.71
	1.22	.05	1.27
	1.39	.37	1.76
	.07	.10	.17
	1.23	.85	2.08
	6.91	17.09	24.00
	25.10	20.86	45.96

RAGE NUMBER OF EMPLOYEES CONSTANTLY SICK.

	White.	Colored.	Total.
	55.76	203.50	259.26
	25.10	20.86	45.96
	80.86	224.36	305.22

NUMBER OF EMPLOYEES CONSTANTLY SICK PER 1,000.

	White.	Colored.	Total.
	12.25	7.11	7.81
	5.51	.73	1.39
	17.76	7.84	9.20

RAGE LENGTH OF STAY IN HOSPITALS OR QUARTERS FOR EACH ADMISSION OF SICK EMPLOYEE.

	White.	Colored.	Total.
al	15.40	27.17	23.53
l	9.52	8.64	8.93
ge)	14.10	23.31	20.44
	1.93	5.07	2.00
	2.55	2.55	2.55
	2.79	3.00	2.80
	2.42	2.39	2.41
	3.71	1.65	2.10
	3.04	5.17	3.65
	2.70	6.94	4.78
ge)	2.41	5.60	3.25

TABLE XII.—PATIENTS OTHER THAN EMPLOYEES TREATED IN HOSPITALS AND AMOUNTS RECEIVED FOR THEIR TREATMENT (INCLUDING PALO SECO LEPER ASYLUM).

	Number of admissions.	Number of days treatment.	Revenue received.
Paid for by Panama Republic:			
Insane	130	65,957	$57,102.00
Colon Hospital	154	351	904.40
Palo Seco Leper Asylum	10	14,900	10,660.57
Total	294	81,211	68,666.97
For whom department of civil government pay $2,400 per year (charity patients)	687	44,538	2,400.00
Outside pay patients	578	9,242	44,232.98
Families of employees	2,979	42,677	49,207.21
Soldiers	2,021	29,557	50,994.51
Public health service	202	4,038	6,148.49
Residents of Panama, emergency charity cases	23	161	.....
Total	6,784	211,424	221,650.16

TABLE XIII.—SURGICAL OPERATIONS PERFORMED IN HOSPITALS.

	Ancon Hospital.		Colon Hospital.		Total.	
	Number.	Died.	Number.	Died.	Number.	Died.
Amputations:						
Shoulder	2	.....	.....	.....	2	.....
Arm	1	1	.....	.....	1	1
Forearm	2	.....	1	.....	3	.....
Thigh	2	1	.....	.....	2	1
Leg	4	.....	.....	.....	4	.....
Foot	1	.....	.....	.....	1	.....
Digits, multiple	9	.....	2	.....	11	.....
Leg, double	3	.....	.....	.....	3	.....
Operations on bones:						
Craniectomy, decompressive	5	1	.....	.....	5	1
Craniectomy, exploratory	.....	.....	1	.....	1	.....
Laminectomy	1	1	.....	.....	1	1
Ostiectomy	22	.....	4	.....	26	.....
Resection of knee (arthrotomy of knee joint)	4	.....	.....	.....	4	.....
Wiring of fractures—						
Simple	22	.....	.....	.....	22	.....
Compound	11	1	.....	.....	11	1
Bone transplantation	1	.....	.....	.....	1	.....
Adenectomy:						
Cervical	18	.....	.....	.....	18	.....
Axillary	3	.....	.....	.....	3	.....
Inguinal—						
Single	167	.....	3	.....	170	.....
Double	42	.....	1	.....	43	.....
Femoral	16	.....	3	.....	19	.....

TABLE XIII.—SURGICAL OPERATIONS PERFORMED IN HOSPITALS—Continued.

	Ancon Hospital.		Colon Hospital.		Total.	
	Number.	Died.	Number.	Died.	Number.	Died.
Herniotomy:						
Inguinal—						
Single	80	.....	36	.....	116	.....
Double	13	.....	15	.....	28	.....
Femoral	2	.....	.....	.....	2	.....
Ventral	9	.....	.....	.....	9	.....
Strangulated	.....	.....	1	.....	1	.....
Genito-urinary tract:						
Nephrotomy	2	.....	1	.....	3	.....
Nephrectomy	2	.....	.....	.....	2	.....
Nephropexy	3	.....	.....	.....	3	.....
Ureterotomy	2	.....	.....	.....	2	.....
Urethrotomy—						
Internal	10	1	1	.....	11	1
External	19	1	1	.....	20	1
Prostatectomy	2	.....	.....	.....	2	.....
Varicocele, radical cure	23	.....	6	.....	29	.....
Hydrocele—						
Single, radical cure	24	.....	4	.....	28	.....
Double, radical cure	5	.....	.....	.....	5	.....
Orchidectomy	4	.....	1	.....	5	.....
Epididymotomy	109	.....	3	.....	112	.....
Amputation of the scrotum	7	.....	.....	.....	7	.....
Amputation of the penis	1	.....	.....	.....	1	.....
Curetage uteri	84	.....	23	.....	107	.....
Perineoplasty	17	.....	.....	.....	17	.....
Trachelorrhaphy	12	.....	3	.....	15	.....
Vaginal punctures	1	.....	.....	.....	1	.....
Obstetrical:						
Cæsarian section—						
Abdominal	9	3	.....	.....	9	3
Vaginal	1	.....	.....	.....	1	.....
Accouchment force	2	1	.....	.....	2	1
High forceps	2	.....	1	.....	3	.....
Low forceps	7	.....	1	.....	8	.....
Version	5	.....	1	.....	6	.....
Perineorrhaphy	5	.....	4	.....	9	.....
Thorax						
Thoracotomy	3	1	2	.....	5	1
Excision of breast and axilla	1	.....	.....	.....	1	.....
Rectum:						
Hemorrhoids, radical cure	97	2	9	.....	106	2
Fistula in anus, excision of	20	.....	2	.....	22	.....
Prolapsus rectum, radical excision	.....	.....	1	.....	1	.....
General:						
Thyroidectomy	8	.....	.....	.....	8	.....
Aneurismorrhaphy	1	.....	1	.....	2	.....
Varicose veins, excision of	15	.....	.....	.....	15	.....
Tenorrhaphy	13	.....	8	.....	21	.....
Myorrhaphy	2	.....	3	.....	5	.....
Excision of surface neoplasms	31	.....	4	.....	35	.....
Gunshot wound of soft parts, operation for	.....	.....	2	.....	2	.....
Stab wound of soft parts, operation for	.....	.....	3	.....	3	.....

TABLE XIII.—SURGICAL OPERATIONS PERFORMED IN HOSPITALS—Continued.

	Ancon Hospital.		Colon Hospital.		Total.	
	Number.	Died.	Number.	Died.	Number.	Died.
General—Continued.						
Extensive injuries to soft parts, operation	.....	.....	14	.....	14	.....
Plastic operation for—						
Congenital defect	4	.....	.....	.....	4	.....
Severe injuries	7	.....	.....	.....	7	.....
Effects of disease	11	1	.....	.....	11	1
Skin graft	3	.....	.....	.....	3	.....
Laparotomy:						
For general peritonitis	5	2	.....	.....	5	2
For tuberculous peritonitis	6	4	.....	.....	6	4
For intestinal obstruction	6	.....	.....	.....	6	.....
Exploratory	15	2	.....	.....	15	2
Gastrotomy	1	.....	.....	.....	1	.....
Gastro-enterostomy	11	2	3	.....	14	2
Entero-enterostomy	1	.....	.....	.....	1	.....
Enterectomy	4	2	.....	.....	4	2
Appendectomy	130	.....	43	.....	173	.....
Appendectomy with local peritonitis	19	1	5	1	24	2
Colostomy	3	1	.....	.....	3	1
Sigmoidopexy	1	.....	.....	.....	1	.....
Cholecystotomy	3	.....	.....	.....	3	.....
Cholecystostomy	2	.....	.....	.....	2	.....
Cholecystectomy	6	.....	1	.....	7	.....
Choledochotomy	2	.....	.....	.....	2	.....
Abscess of liver:						
Laparo-hepatotomy for	2	.....	.....	.....	2	.....
Thoraco-hepatotomy for	2	1	.....	.....	2	1
Splenectomy	1	.....	1	.....	2	.....
Pan-hysterectomy	4	1	7	.....	11	1
Supravaginal hysterectomy	51	4	.....	.....	51	4
Hysteromyomectomy	40	.....	.....	.....	40	.....
Myomectomy	1	.....	2	.....	3	.....
Salpingectomy:						
Single	7	.....	.....	.....	7	.....
Double	5	.....	.....	.....	5	.....
Salpingo-oophorectomy	23	.....	2	1	25	1
Ovarian cystectomy	11	.....	2	.....	13	.....
Oophorectomy	5	.....	.....	.....	5	.....
Suspensio-uteri	43	.....	10	.....	53	.....
Plastic operation for chronic pelvic peritonitis	5	.....	.....	.....	5	.....
For ectopic gestation	1	.....	.....	.....	1	.....
Pylorectomy	3	.....	.....	.....	3	.....
Gastrectomy	4	.....	.....	.....	4	.....
For trauma:						
Rupture of spleen	1	.....	.....	.....	1	.....
Major operations, various others	21	2	3	.....	24	2
Minor operations:						
Various	1,341	3	98	.....	1,439	3
Various (dispensary)	.....	.....	1,658	.....	1,658	.....

TABLE XIV.—OPERATIONS AND WORK PERFORMED IN EYE, EAR, NOSE, AND THROAT CLINICS.

	Number.
Adenoidectomy	182
Advancement of internal rectus	2
Antral sinusotomy, intranasal	1
Abscess, mastoid region	1
Enucleation	4
Evisceration	2
Excision of chalazion	1
Expression	2
Extraction of cataract	7
Frontal sinus radical	2
Iridectomy	1
Mastoidectomy	10
Plastic—	
Face	1
Nose	2
Pterygium—	
Excision	22
Transplantation	17
Perforation right antrum	1
Removal of steel from eyeball (magnet)	1
Removal of foreign body from nose	1
Sinusotomy, frontal	5
Submucous resection of nasal septum	100
Sinusotomy, maxillary	1
Tonsillectomy	229
Trephine Fergus Elliott	1
Trephine of schlera for chronic glaucoma	1
Various minor operations	57
Turbinectomy	27
Total	681
Refractions	1,378
Outside cases treated	7,644

TABLE XV.—CONSOLIDATED WARD LABORATORY REPORT ANCON AND COLON HOSPITALS.

Blood examinations	7,901	Urine examinations	22,357
Estivoautumnal	831	Albumin	5,140
Tertian	198	Casts	4,460
Mixed tertian and estivoautumnal	3	Sugar	1,484
Quartan	8	Pus and blood	8,252
Differential blood counts	271	Indican	881
Leucocyte counts	946	Epithelia	9,575
Red blood counts	69	Bile	296
White blood counts	115	Trichomonas vaginalis	3
Hemoglobein estimations	1,420	Hemin crystals	48
Filariasis	1	Guaiac tests	431
Spirilla of relapsing fever	3	Ciliated monads	35
Stool examinations	7,274	Triple phosphates	62
Ascaris lumbricoides	110	Red blood cells	7
Uncinaria ova	301	Quantitative estimation of albumen in urine	22
Tricocephalus dispar	258	Urea determinations	3
Strongyloides intestinalis	176	Acetone tests	84
Amoeba	22	Calcium oxalates	10
Entamoeba	5	Benzidine tests	15
Ciliated monads	167	Sputum examinations	3,419
Bilharzia	2	Tubercle bacilli	313
Pus and blood	624	Pus cells	9
Entamoeba, histolytica and tetragena	38	Pneumococci	8
Guaiac tests	199	Diphtheria	2
Cercomonas, intestinalis	22	Smear examinations	560
Tenia saginata dispar (ova)	14	Examinations of spinal fluid	74
Blood and mucous	3	Examinations of vaginal and urethal discharges	287
Benzidine tests	1	Examinations of urine sediment	15
Oxyuris, vermiculosis	4	Eye	17
Uncinaria (parasites)	2	Various	29

TABLE XVI.—SANTO TOMAS HOSPITAL.

Class.	Remaining Jan. 1.	Admitted.	Died.	Discharged.	Remaining Dec. 31.
Pay patients	40	840	31	834	15
Charity patients	411	9,991	976	9,010	416
Total	451	10,831	1,007	9,844	431

Class.	Number treated.	Americans.		Other nations.	
		White.	Black.	White.	Black.
Pay cases	880	33	9	312	526
Charity cases	10,402	52	4	993	9,353
Total	11,282	85	13	1,305	9,878

Number of days relief furnished patients	163,867
Average number of patients constantly sick	447
Average number of days' treatment per patient	14.50

Operations, surgical.	Number.	Died.
Major	1,237	43
Minor	527	
Total	1,764	43

DISPENSARY REPORT.

Class.	White.	Colored.	Total.
Natives	322	7,391	7,713
Foreigners	568	4,386	4,954
Total	890	11,777	12,667

TABLE XVII.—SANITATION.

CITY OF PANAMA.

Mosquito, rat, and fly work:		
Ditches dug	miles	2.1
Ditches cleaned	do	88.4
Pools oiled	acres	745
Water containers treated		153,738
Mosquito-breeding places found (stegomyia—1568)		3,304
Flies trapped (13,000 to quart)	quarts	606
Fly-breeding places destroyed		299
Vegetation removed	acres	57
Rats trapped		12,263
Disinfection work: Rooms disinfected		175
Material used:		
Crude oil	gallons	45,520
Larvacide	do	6,732
Kerosene	do	737
Inspection of houses and yards:		
Houses inspected		52,232
Old buildings condemned		166
Buildings demolished		57
Plans for new buildings approved		247
Permits granted for repairs to old buildings		1,111
Notices served and nuisances abated		4,495
Private properties cleaned		55
Street cleaning:		
Square yards cleaned daily		600,000
Square yards sprinkled daily		55,209
Garbage collections:		
Loads of garbage removed to dump and burned		59,053
Cans of garbage emptied		507,931
Vaccinations: Persons vaccinated		1,949

COLON, CRISTOBAL, AND MOUNT HOPE.

Water and sewers:		
Connections made during the year		143
Total connections made to date		1,368
Outstanding permits, December 31		30
Houses in which extensions were made		80
Houses:		
Plans approved		102
Permits to repair issued		587
Permits to occupy issued		186
Bills collected for work done for private parties		1,891
Sanitation of Colon:		
Loads of yard garbage removed		6,943
Cans of garbage removed		744,630
Private properties cleaned		8,880
Acres of vegetation removed		671
Acres of streets cleaned		9,731
Acres of alleys cleaned		1,647
Acres of streets sprinkled		615
Linear feet of ditches constructed		11,295
Miles of ditches maintained		516
Acres of pools oiled		138
Square yards of streets oiled		17,313
Gallons of oil used for streets		6,250
Mosquito-breeding places destroyed		140
Water receptacles treated		608,877
Mosquitoes caught on hospital screens		11,447
Fly-breeding places destroyed		163
Buildings inspected		122,971
Nuisances abated		3,991
Rats killed		3,316
Dogs killed		275
Cubic yards fumigated		12,521
Gallons of crude oil used		10,843
Gallons of larvacide issued		1,998

TABLE XVII.—SANITATION—Continued.

COLON, CRISTOBAL, AND MOUNT HOPE—Continued.

Sanitation of Cristobal:	
Square yards of pools oiled	107,401
Acres of vegetation removed	2.75
Water receptacles treated	95,335
Mosquito-breeding places destroyed	21
Fly-breeding places destroyed	38
Buildings inspected	17,270
Nuisances abated	574
Loads of garbage removed	2,280
Cans of garbage removed	170,757
Gallons of crude oil used	3,487
Gallons of larvacide used	215
Sanitation of Mount Hope:	
Acres of pools oiled	307
Acres of vegetation removed	520
Miles of ditches maintained	49.3
Water receptacles treated	160,100
Mosquito-breeding places destroyed	1,256
Miles of ditches constructed	2.9
Cans of garbage removed	15,085
Gallons of crude oil used	26,220
Gallons of larvacide used	1,503
Mosquitoes caught—	
In quarters	17,862
In barracks	25,178
On boats	1,197

CANAL ZONE.

Work requests on supply department:	
Grass cutting	270
Screen repairing	101
Miscellaneous	103
Work requests on municipal engineering department	186
Work requests on other departments	23
Buildings inspected:	
For screening	13,029
For mosquitoes	63,100
For general sanitation	27,191
For safety	26
Inspections of stores	394
Inspections of restaurants	66
Inspections of shops	783
Notices served for abatement of nuisances	41
Arrests for violations of sanitary regulations	9
Convictions	7
Garbage cans emptied daily	2,969
Closets disinfected	10,974
Houses fumigated or disinfected	33
Mosquitoes destroyed in houses:	
Adult anopheles	51,862
Adult culices	147,936
Adult stegomyia	1,215
Adult mansonia	61,580
Number of containers found with stegomyia larvæ	20
Fly-breeding places destroyed	20
Rats destroyed	7,269
Material used:	
Crude oil ..... gallons	141,673
Larvacide ..... do	6,604
Kerosene ..... do	7,225

TABLE XVIII.--QUARANTINE SERVICE.

PORTS OF PANAMA-BALBOA AND COLON-CRISTOBAL.

Vessels inspected and passed	2,155
Vessels detained in quarantine	191
Vessels detained but sailing in quarantine	38
Supplementary inspections of vessels detained	664
Vessels fumigated on arrival	191
Vessels fumigated on departure	26
Crew inspected	134,086
Passengers inspected	44,309
Stowaways inspected	44
Total persons examined	178,439
Supplementary inspections	27,203
Persons vaccinated at ports of arrival because of compulsory vaccination law	3,813
Persons vaccinated at ports of departure or en route because of compulsory vaccination law	12,868
Total persons vaccinated	16,681
Persons held in quarantine at the detention stations to complete period of incubation of yellow fever or plague	4,375
Persons held in quarantine on board vessels to complete period of incubation of yellow fever and plague	21,405
Poliomyelitis suspects detained	45
Total persons held in quarantine	25,825
Persons landed from foreign ports:	
Cabin	20,524
Steerage	13,821
Total	34,345
Persons embarked for foreign ports:	
Cabin	20,483
Steerage	15,875
Total	36,358
Apparent decrease for the year from foreign ports:	
Cabin (increase)	41
Steerage (decrease)	2,054
Total (decrease)	2,013
Persons arriving from coast towns on small craft	21,510
Persons embarked for coast towns on small craft	18,534
Apparent increase for the year from coast towns	2,976
Total number of persons landed	55,855
Total number of persons embarked	54,892
Excess over number embarked	963
Less number for Pacific ports	2,774
Apparent decrease for year	1,811
Immigrants recommended for rejection and deportation	311
Bills of health issued	2,159
Clearances issued	290
Inspections of docks	181
Inspections of vessels at docks	670

BOCAS DEL TORO.

Vessels inspected and passed	206
Crews inspected and passed	15,204
Passengers inspected and passed	2,718
Passengers, in transit, inspected and passed	1,921

TABLE XIX.—PERSONNEL REPORT.

[Average number of employees at work during year.]

	1916	1915	Dec. 31, 1916.		
			Gold.	Silver.	Total.
Chief health office	4	4	3	.....	3
Medical storehouse	8	8	4	4	8
Quarantine service	45	42	12	34	46
Health office:					
Panama	159	162	12	140	152
Colon	172	153	10	148	158
Ancon Hospital	362	333	124	246	370
Colon Hospital	41	36	17	26	43
Santo Tomas Hospital	6	5	6	.....	6
Palo Seco Leper Asylum	29	27	2	34	36
Zone sanitation	124	118	6	115	121
Hospital farm	59	49	2	66	68
Dispensaries:					
Balboa	7	6	5	3	8
Gamboa	1	1	1	.....	1
Gatun	4	4	2	2	4
Paraiso	4	4	2	2	4
Pedro Miguel	3	3	2	1	3
Total	1,028	963	210	821	1,031

TABLE XX.—HOSPITAL AND TOTAL CASES OF MALARIA AMONG EMPLOYEES.

	Admissions.				Deaths.				Total cases.	
	White.		Colored.		White.		Colored.			
	Hospital.	Total.	Hospital.	Total.	Hospital.	Total.	Hospital.	Total.	Hospital.	Total.
January	10	19	30	30	.....	.....	.....	.....	40	49
February	15	18	26	27	.....	.....	.....	.....	41	45
March	8	11	7	9	.....	.....	.....	.....	15	20
April	6	9	12	13	.....	.....	.....	.....	18	22
May	7	8	20	22	.....	.....	.....	.....	27	30
June	20	24	38	38	.....	.....	1	1	58	62
July	26	30	88	89	.....	.....	.....	.....	114	119
August	14	21	63	63	.....	.....	.....	.....	77	84
September	9	10	28	29	.....	.....	.....	.....	37	39
October	18	18	19	19	.....	.....	1	1	37	37
November	3	3	12	13	.....	.....	.....	.....	15	16
December	8	9	15	15	.....	.....	.....	.....	23	24
Total	144	180	358	367	.....	.....	2	2	502	547

.E XX.—HOSPITAL AND TOTAL CASES OF MALARIA AMONG EMPLOYEES—Continued.

	Annual average per 1,000 deaths.		Annual average per 1,000 cases.		Number of employees.
	Hospital.	Total.	Hospital.	Total.	
ıary			15	19	31,223
ruary			16	18	30,497
ch			5	7	33,084
il			6	8	33,856
			9	10	34,393
	0.38	0.38	22	24	31,501
			40	42	33,787
ust			28	30	33,609
ember			13	14	33,528
ber	.36	.36	13	13	38,272
ember			5	5	35,031
mber			8	8	34,327
Total	.06	.06	15	16	33,176

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REPORT

OF THE

HEALTH DEPARTMENT

OF

THE PANAMA CANAL

FOR THE

CALENDAR YEAR

1917

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Colonel, Medical Corps, United States Army
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LETTER OF TRANSMITTAL.

BALBOA HEIGHTS, CANAL ZONE,
January 28, 1918.

Col. CHESTER HARDING,
Governor, The Panama Canal.

SIR: I have the honor to submit the following report of the operations of the health department for the calendar year 1917.

Respectfully,

ALBERT E. TRUBY,
Chief Health Officer.

PERSONNEL.

There have been many changes in the organization of the department during the year. Before the declaration of war in April, 1917, there were 12 officers of the Medical Corps of the Army on duty with the health department. All but the present chief health officer have been relieved by War Department orders, and in addition four civilian physicians and three other employees of the department were commissioned in the reserve corps and ordered to the United States. The medical officers relieved were:

Col. Deane C. Howard, chief health officer.
Maj. E. E. Persons, assistant chief health officer.
Maj. F. F. Russell, chief of laboratory.
Maj. Wm. A. Duncan, chief of X-ray clinic, Ancon Hospital.
Maj. Guy L. Qualls, surgical staff, Ancon Hospital.
Maj. Thomas D. Woodson, superintendent, Corozal Hospital.
Capt. T. J. Leary, superintendent, Colon Hospital.
Capt. Wm. E. Hall, chief eye and ear clinic, Ancon Hospital.
Capt. Charles E. McBrayer, health officer, Colon-Cristobal.
Capt. D. W. Harmon, chief sanitary inspector.
Capt. H. P. Carter, health officer, Panama.

The vacancies caused by the return of these officers to active service have been filled for the greater part by officers of the Medical Reserve Corps. As stated in the monthly report for August, these changes made it difficult to carry on sanitary work in the Zone and terminal cities at the highest standard of efficiency. These Reserve Corps officers are well qualified physicians, but necessarily lack experience in administration and tropical sanitation which is essential to secure the best results. It is gratifying to state that all of them have shown great interest in their new duties, and that they are doing their utmost to maintain the standards set by their predecessors.

GENERAL REMARKS.

Health conditions on the Isthmus during the year have been excellent. Except for one case of smallpox and two cases of leprosy brought to the Isthmus, no cases of maritime quarantinable disease have originated on or been brought to the Isthmus during the year. No cases of yellow fever or bubonic plague have occurred on the Isthmus during the year 1917. The last case of yellow fever occurred in November, 1905, and the last case brought to the Isthmus was on December 10, 1915. The last case of bubonic plague contracted on the Isthmus occurred in August, 1905. No cases of smallpox have been contracted on the Isthmus since 1907, except two cases in November, 1916, which were contacts from an imported case. The one case of smallpox brought to the Isthmus in 1917 appeared at Balboa quarantine on August 22 in the person of a passenger from Bolivia who arrived on the steamship *Ayacucho*; all passengers and members of the crew were vaccinated, fumigation carried out, and the bedding used by patient destroyed; patient had been isolated aboard the ship immediately on the appearance of the eruption; it is probable that the disease was contracted in the interior of Bolivia, where smallpox is known to be more or less prevalent; the case recovered and was discharged on September 23, 1917.

INFANTILE PARALYSIS.

A case of infantile paralysis was admitted to Ancon Hospital from Pedro Miguel district on July 31, 1917. The patient was a child 3 years old, without history of contact with any previous case of the disease. The child had not been out of the Pedro Miguel district for two years. This was evidently a sporadic case, similar to the two cases appearing in the Balboa district in December, 1916, which also were without history of outside contact. The patient was isolated, the quarantine of all children contacts maintained, and the usual methods of disinfection carried out. The patient made a good recovery and no other cases occurred.

MALARIA.

The admission rate for malaria to both hospitals and quarters, for employees, was 14.51 per 1,000, as compared with 16.49 for 1916 and 51.20 for 1915. The noneffective rate for malaria was 0.48 as compared with 0.59 for 1916 and 1.19 for 1915. This showing is particularly gratifying inasmuch as we anticipated a higher malarial rate for 1917 because of the activities of the supply department in its plantation, pasture, and clearing camps; this work was carried out on a very extensive scale, and required the sheltering of a large number of men in camps located far from our sanitated areas. Out of a total of 473 employees admitted for malaria, 173 came from these camps.

MEASLES.

Measles has been prevalent, especially in the Balboa district during the last six months of the year. This disease, however, as

well as all other contagious disease of childhood, are invariably mild on the Isthmus, and recovery is rapid and practically without complication and sequelae.

In the terminal cities the death rates for tuberculosis and pneumonia in the colored race, also the high infant mortality rate, are matters for careful consideration. The causes for these high death rates are mainly economic—high cost of food and high rentals. The cost of food has advanced greatly since the war started, and this has resulted in great hardships, especially for the blacks; their incomes are usually small, and the food they are able to buy often unsuitable and insufficient. The results of deficient and improper food are particularly noticeable in cases of tuberculosis and in babies. The high rates charged in Panama and Colon for rooms result in making these people seek quarters which are small and usually unsanitary; it also produces overcrowding, and whole families often have but one small room because they can not afford to rent more or better ones. This department has taken active measures to improve the sanitary condition of such places, by requiring the owners of the buildings to increase the size of lattice windows and ventilating spaces, and making other improvements. An educational campaign on tuberculosis has been started. A visiting nurse has been assigned to assist in this work and to visit cases of tuberculosis. It is urgently recommended that more quarters for silver employees be constructed on the Canal Zone to relieve the overcrowded conditions of Colon and Panama; if this were done it would improve conditions in two ways—relieve the overcrowded condition of the cities and reduce the high prices charged for rent.

The Panama Red Cross has developed into a very active organization, and is doing splendid work along economic lines in baby welfare work. The chief health officer is one of the directors of the organization, and is therefore able to indicate what lines of work are most urgent and important.

CENSUS.

A census of the Canal Zone was taken by the police department in June, 1917, and showed a population (exclusive of military forces) of 24,038. Censuses were also taken of the cities of Panama and Colon, showing a population of 61,074 and 25,386, respectively, these being slight increases over the number shown by the census of December, 1915.

GENERAL MORTALITY.

Deaths in the Canal Zone and the cities of Panama and Colon numbered 2,694, as compared with 2,804 for the preceding year, giving a death rate of 23.63 per 1,000 population, as compared with 23.98 for 1916.

Deaths from the more important diseases.—The table below gives the number of deaths occurring from certain groups of diseases causing the highest mortality rates, as compared with the two preceding years.

	1917	1916	1915
Tuberculosis (various organs)	468	445	353
Diarrhea and enteritis	425	415	442
Pneumonia (including broncho-)	343	373	315
Diseases of early infancy	237	211	287
Nephritis (acute and chronic)	178	208	179
Organic heart disease (including endocarditis)	161	139	151
Bronchitis (acute and chronic)	116	115	154
Cancer (various organs)	39	48	36
Total population	114,003	116,918	121,650
Rate per 1,000, all causes	23.63	23.98	23.51

Tuberculosis in its various forms caused 468 deaths among the population of the Canal Zone and the cities of Panama and Colon in 1917, giving a rate of 4.11 [1] per 1,000, as compared with a rate of 1.41 in the registration area of the United States in 1916.

Pneumonia (including broncho-pneumonia) was responsible for 343 deaths in 1917, giving a rate of 3.01, as compared with 1.37 in the registration area of the United States in 1916.

Diarrhea and enteritis caused 425 deaths in 1917, giving a rate of 3.73, as compared with 0.79 in the registration area of the United States in 1916.

Diseases of the heart.—The deaths from heart diseases (organic diseases of the heart and endocarditis) numbered 161, or 1.41 per 1,000 population, as compared with 1.59, the rate for the registration area of the United States in 1916.

Bright's disease (acute and chronic nephritis) caused 178 deaths in 1917, giving a rate of 1.56, as compared with a rate of 1.05 for the registration district of the United States in 1916.

Cancer and other malignant tumors were responsible for 39 deaths in 1917, giving a rate of 0.34, as compared with the rate of 0.81 in the registration district of the United States in 1916.

INFANT MORTALITY.

The high infant mortality rate noted in last year's report has continued. That this excessive rate is chiefly caused by poverty, ignorance, inadequate housing facilities, etc., may be seen by a comparison of deaths among children of American families on the Isthmus with those of natives and West Indians for the year 1917:

	Number of births.	Number of deaths.	Death rate per 1,000 births.
American	261	9	34.48
Native and West Indian	4,088	967	236.55

[1] All rates are computed as equivalent annual per 1,000.

Of the 9 deaths occurring among American children, it is a significant fact that in 5 instances (the mother in 3 of these cases was Latin-American) the parents resided in Panama City or Colon. Of the four remaining deaths, where the parents resided in the Canal Zone, all were due to causes of early infancy, the oldest of the four children being only 2½ days of age at time of death. Such a record speaks well for health conditions on the Isthmus for children, where they have proper nourishment and care.

BIRTHS.

Births and stillbirths together numbered 4,681, giving a birth rate of 41.06 per 1,000 population, as compared with 37.65 for the preceding year. Of the total births reported, 7 per cent were stillbirths, the same percentage as for the preceding year.

PERMANENT BUILDINGS.

Construction work on the new buildings for Ancon Hospital is progressing rapidly. Two large ward groups and quarters for the superintendent will be erected in 1918; the plans for these buildings are practically finished. This will complete the building program and will provide this community with a thoroughly modern concrete hospital. It will have a bed capacity of about 700, and will compare in every respect with the best of such institutions in the United States.

VITAL STATISTICS.

EMPLOYEES.

The average number of employees on the rolls of the Panama Canal, the Panama Railroad, and contractors doing work for the Panama Canal, for the year was 32,589, as compared with 33,176 for 1916, and 34,785 for 1915.

The total admission rate to hospitals and quarters was 356.75, as compared with 282.76 in 1916 and 320.20 in 1915. For disease alone the admission rate to hospitals was 124.80, as compared with 103.72 in 1916, and 143.82 in 1915. The total admission rate to hospitals only was 160.85, as compared with 140.43 in 1916, and 186.17 in 1915.

The total death rate was 7.09, as against 6.03 in 1916, 5.77 in 1915, and 7.04 in 1914. The death rate for disease alone was 5.74, as against 4.58 in 1916 and 4.05 in 1915.

The constantly noneffective rate from all causes was 9.65, as compared with 9.20 for 1916 and 10.28 for 1915.

The admission rate for malaria, to both hospitals and quarters, was 14.51, as compared with 16.49 for 1916, and 51.20 for 1915. The noneffective rate for malaria was 0.48, as compared with 0.59 for 1916, and 1.19 for 1915.

The admission rate for typhoid fever was 0.18, as compared with 0.66 for 1916, and 0.11 in 1915. No deaths from typhoid fever among employees occurred during the year.

The five diseases causing the highest number of hospital admissions, with their rates, were as follows:

	1916.		1917.	
	Admissions.	Rate.	Admissions.	Rate.
Venereal diseases	521	15.70	634	19.45
Malaria	502	15.13	461	14.14
Influenza	94	2.83	179	5.49
Tuberculosis	107	3.22	137	4.20
Diseases of the eyes and their annexa	122	3.68	109	3.74

The five diseases causing the highest number of deaths with their rates were as follows:

	1916.		1917.	
	Deaths.	Rate.	Deaths.	Rate.
Tuberculosis (various organs)	36	1.09	36	1.10
Lobar pneumonia	31	.93	29	.89
Organic diseases of the heart	12	.36	22	.67
Nephritis (acute and chronic)	20	.60	21	.64
Cerebral hemorrhage	9	.27	8	.24

There were 36 deaths from tuberculosis among employees, being the same number as in 1916, as compared with 27 in 1915. From pneumonia 29 deaths occurred among employees in 1917, as compared with 31 in 1916 and 25 in 1915.

Effects of Race.

The admission rate to hospitals and death rate from disease, for white employees, was 280.02 and 4.57, as compared with 97.89 and 5.94 for black employees.

The admission rate to hospitals and quarters for malaria was 26.80 for whites, as compared with 12.39 for blacks.

The admission rate to hospitals for disease for Americans was 264.35, and the death rate from disease 4.31.

Effects of Season.

The highest death rates for disease occurred in the months of July and August, and the lowest in April and November. The highest admission rates to hospitals for disease were in August and October, and the lowest in February and March.

Canal Zone.

EMPLOYEES AND NONEMPLOYEES.

From an average population of 27,543 in the Canal Zone there was a total of 313 deaths during the year. Of these, 273 deaths were from disease, giving a rate of 9.91, as compared with 9.22 for 1916, and 11.30 for 1915.

The death rate for tuberculosis was 1.31, as compared with 1.30 for 1916. Deaths from tuberculosis this year were 11½ per cent of all deaths.

There were 669 births reported during the year, giving a birth rate of 24.29. Of these, 225 were white, and 444 black.

There were 85 deaths which occurred among children under 1 year of age, 4 white and 80 black, giving an infant mortality rate, based on the number of births reported for the year, of 17.77 for white, and 180.80 for black children, with a general average of 125.56 per 1,000 births.

Of the total deaths, 27 per cent occurred among children under 1 year of age, and 37 per cent among children under 5 years of age.

Of the total births reported, 6 per cent were stillbirths.

Below is a table showing the death rates for the Canal Zone from 1905 to 1917, inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	23,463	828	35.29	1912	79,279	1,129	14.24
1906	34,095	1,700	49.86	1913	61,700	1,047	16.97
1907	54,036	1,708	31.60	1914	46,379	710	15.31
1908	67,146	1,273	18.95	1915	31,946	410	12.83
1909	76,900	1,025	13.33	1916	31,447	343	10.91
1910	86,465	1,251	14.47	1917	[1] 27,543	313	11.36
1911	90,434	1,385	15.32				

[1] Average population for the year, excluding the military for the last six months.

Panama City.

EMPLOYEES AND NONEMPLOYEES.

The population of the city, as shown by the health department census of June, 1917, is 61,369.

From an average population of 61,074, there was a total of 1,714 deaths during the year. Of these 1,661 were from disease, giving a rate of 27.19, as compared with 28 for 1916, and 28.97 for 1915.

The principal causes of death, as compared with last year, were as follows:

	1916	1917
Diarrhea and enteritis (including colitis)	342	33
Tuberculosis (various organs)	313	31
Pneumonia (lobar and broncho)	203	21
Nephritis (acute and chronic)	106	9
Organic diseases of the heart	68	8

The death rate from tuberculosis was 5.22, as compared with 5.15 for 1916, being 18½ per cent of the total deaths this year, as compared with 17½ per cent for 1916.

There were 2,772 births reported during the year, giving a birth rate of 45.39.

There were 668 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported for the year, of 240.98.

Of the total deaths, 39 per cent occurred among children under 1 year of age, and 50 per cent among children under 5 years of age.

Of the total births reported, 7 per cent were stillbirths.

Below is a table showing the death rate in Panama City from 1905 to 1917, inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	21,984	1,447	65.82	1912	47,057	1,380	29.3
1906	25,518	1,142	44.75	1913	47,172	1,507	31.9
1907	33,548	1,156	34.45	1914	53,948	1,863	34.5
1908	37,073	1,292	34.83	1915	60,373	1,810	29.9
1909	40,801	1,038	25.44	1916	60,778	1,765	29.0
1910	45,591	1,446	31.72	1917	61,074	1,714	28.0
1911	46,555	1,456	31.27				

COLON.

EMPLOYEES AND NONEMPLOYEES.

From an average population of 25,386, a total of 667 deaths occurred during the year. Of these, 642 were from disease, giving a rate of 25.29 from disease alone, as compared with 26.81 for 1916 and 20.59 for 1915.

The principal causes of deaths, as compared with last year, were as follows:

	1916	1917
Tuberculosis (various organs)	91	113
Pneumonia (lobar and broncho)	117	95
Diarrhea and enteritis (including colitis)	48	74
Nephritis (acute and chronic)	80	61
Bronchitis (acute and chronic)	61	55

The death rate from tuberculosis was 4.45, as compared with 3.69 for 1916, being 17 per cent of the total deaths this year, as compared with 13 per cent for 1916.

There were 908 births reported during the year, giving a birth rate of 35.77.

There were 222 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported for the year, of 244.49.

Of the total deaths, 33 per cent occurred among children under 1 year of age, and 43 per cent among children under 5 years of age.

Of the total births reported, 7 per cent were stillbirths.

Below is a table showing the death rate in Colon from 1905 to 1917 inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	11,176	553	49.48	1912	20,174	493	24.44
1906	13,651	703	51.42	1913	20,232	489	24.17
1907	14,549	571	39.24	1914	23,265	590	25.36
1908	15,878	418	26.32	1915	29,331	640	21.82
1909	17,479	396	22.65	1916	24,693	696	28.19
1910	19,535	514	26.31	1917	25,386	667	26.27
1911	19,947	527	26.42				

DIVISION OF HOSPITALS.

ANCON HOSPITAL.

The total admissions to the hospital during the year numbered 10,880, as compared with 9,116 for 1916, and 10,652 for 1915. The average number of patients constantly in the hospital during the year was 483, as compared with 449 for 1916.

PERMANENT BUILDINGS.

The board of health laboratory was occupied in February. It contains laboratories for the director in research work, the bacteriologist, pathologist, chemist, entomologist, and undertaker; also offices, autopsy rooms, photographic studio, library, museum, and a basement for animals.

The crematory, housed in a separate building immediately adjacent to the laboratory, was connected with the board of health laboratory building by a concrete walled and roofed passageway.

Section "B," the second ward unit of the new hospital, was occupied in April and will accommodate more than 100 patients. The section contains 37 private rooms, 7 small wards, 2 cells, and necessary service rooms.

The admitting office and dispensary building was occupied in May. This building has on the first floor, offices, waiting and examining rooms, and drug store for both gold and silver patients; and on the second floor, two suites of dental rooms, and quarters for the staff.

The administration and clinics building, being practically completed, was occupied in December. The administrative offices and file rooms, on second floor, the medical clinic and eye and ear clinic on first floor, and drug store in basement, were housed in the building at the end of the year. The remaining parts of the building, X-ray clinic on first floor, library and reading room on second floor, and entire third floor to be occupied exclusively by the surgical department, will be completed in the near future. Nonreceipt of building material and equipment due to shipping congestion being the cause for the delay.

The kitchen and mess building is rapidly approaching completion.

The isolation building for contagious diseases is also nearing completion.

The passageways connecting section "A" and section "B" with the administration building, were practically completed.

The nurses' quarters was ready to receive roof.

Work was commenced on site to receive section "C" of the new hospital.

OLD BUILDINGS EVACUATED.

Building 237, wards 5 and 6, were evacuated in March and turned over to the building division, which used same as field office, storeroom, and carpenter shop, in connection with construction of the administration and clinics building and kitchen and mess hall.

Building 238, section "B," wards 7, 8, 9, 10, were evacuated in April and turned over to the supply department for razing and reerection at Pedro Miguel as silver quarters. The new kitchen is being erected on this site.

Building 246 was also evacuated, cut in two, and moved onto the fill below new section "A," and the site it occupied used for the new isolation building. The halves were connected, new connections made with sewer, light, and water, and continued in service for occupancy by patients.

Building 232, steward's quarters, was razed in December, as also were buildings 234-236, which housed the drug store, clinics, and library, and the site is being used for new section "C."

Building 334, admitting office and dispensary, was razed in May. All material of value was sent to Corozal Hospital for future use.

Building 335 was taken over by district quartermaster for married quarters.

Building 265, section "C," wards 11 and 12, was evacuated in September; building razed; site to be used for new nurses' quarters, active construction of which has progressed as before mentioned.

Building 224, ward 15, was turned over to the building division for use as storeroom and field office. Building 237, wards 5 and 6, at present so used, to be razed in the immediate future.

As soon as building 240, operating room, can be evacuated, the permanent ground improvements, such as walks, roads, lawns, etc., will be immediately undertaken.

SURGICAL CLINIC.

During the year 1,668 major operations and 1,775 minor operations were performed. There were 301 obstetrical cases delivered. Three thousand one hundred and eighty-four cases visited the out-patient department, for whom 560 prescriptions were written.

MEDICAL CLINIC.

There were 3,184 cases treated in the out-patient department, for whom 2,806 prescriptions were written.

EYE AND EAR CLINIC.

There were 856 operations performed, 1,108 refractions done, and 5,426 treated in the out-patient department, for whom 522 prescriptions were written.

X-RAY CLINIC.

There were 2,205 cases treated during the year, 4,930 plates used, 340 dental films taken, and 57 treatments given.

DISEASES.

No new cases of smallpox developed from the three cases treated the latter part of 1916. During the year 1,699 adults were vaccinated with 410 known "takes," and 62 school children with 37 known "takes."

In January there was an epidemic of an acute intestinal infection, undetermined (with or without as the case may be) mesenteric adenitis and perityphlitis.

There was an increase in the number of measles and chickenpox cases treated.

STEWARD'S DEPARTMENT.

Necessary upkeep repairs were made on equipment and plant. Gold mess pantry was remodeled and a new steam table installed, the table replaced being transferred to the silver mess, heretofore not so equipped.

There were 181,453 rations issued to hospital patients, and 61,581 to personnel entitled to same; a total of 243,034 rations, at a net cost of $81,902.08.

There were 28,682 rations issued to pay boarders at the mess.

There were 268,968 pounds of bread baked from 204,031 pounds of flour, at a cost of $13,141.41.

MAINTENANCE AND REPAIRS.

The usual routine work was performed by hospital artisans, and the plumbing material, lumber, locks, etc., salvaged from the several buildings razed.

MOTOR TRANSPORTATION.

During the year all cars were overhauled or in process of being overhauled mechanically, and the following changes made: Touring car 109 was remodeled into an ambulance, new No. 307. New bodies were made for trucks 501 and 502. Ambulance body was removed from car U. S. No. 305, to be refitted with a hearse body, rebuilt from surveyed horse-drawn conveyance. The present hearse U. S. No. 301 is to be refitted with ambulance body and transferred to a line station for district physician's use.

COROZAL HOSPITAL (INSANE).

During the year, 193 patients were admitted, 30 died, and 129 were discharged. Among the discharges are included 8 patients who were deported or transferred to other institutions for further treatment.

The average number of patients constantly under treatment during the year was 343, as compared to 290 for 1916.

Buildings.—During the year the following changes were made in the buildings: The old Ancon admitting office was reerected in the garden at the farm, and will be used as an office for the farm manager and sleeping quarters for the watchman. A new vegetable and implement house and a breeding house for guinea pigs and rabbits were built at the garden. A dipping vat, 1,500-gallon capacity, was built at the dairy to eradicate ticks. This has proved a great success in getting the cows in better physical condition and increasing their milk production. The fire exits on the wards were fixed by permission of the fire department so that they can be of more use during a fire.

Hospital department.—The hospital has shown a gradual increase in patients in spite of the fact that frequent deportations to the British West Indies have been made. With a staff of physicians and nurses trained in this line of work, it has been our aim to run this hospital like up-to-date scientific hospitals in the United States. So far we have met with success. All cases are classified according to their mental disorder, by the aid of thorough histories, case notes, and laboratory findings, thus each case is afforded proper individual treatment. Various forms of amusements, such as motion pictures, concerts, and games on the wards, are the forms of recreation given the patients, as well as daily walks in the vicinity of the hospital. The patients are beginning to manifest

more interest in the occupation ward. Aside from making hats, they are being taught to crochet, and to make rugs. This helps the patients to distract their attention from their morbid feelings. Some of the male patients are allowed to cultivate a truck garden within the hospital inclosure under the supervision of an attendant. This has proved successful, producing about $125 monthly. An attempt is being made to teach some of the male patients hat and rug making as done by the female patients. Although handicapped in not having a hydrotherapeutic room, an effort has been made to carry out this treatment on the wards. In order to make the patients' surroundings more pleasant, several flower beds have been added to the lawns, providing cut flowers for the wards. A neurological clinic has been established at Ancon Hospital where cases not requiring hospital treatment may consult the staff of Corozal Hospital.

Farm department.—Dairy.—The demand for Corozal farm milk has increased so that at present we are supplying about 200 quarts daily to sick adults and children, aside from the regular supply to the hospitals of the department. There has been no increase of the stock, but by more careful feeding the milk output has been increased. An effort has been made to raise all heifer calves from good milking mothers. The tuberculin test is made regularly, and one cow was condemned after positive reaction at last test. The quality of the milk continues to be of high standard. It is practically free from bacteria, and the fat content runs about 1.5 to 2 per cent above the legal requirement.

Piggery.—A process is under way whereby all our pigs will be immunized permanently against hog cholera. With this method we will save the expense of administering serum, and it will enable us to raise many more pigs than before. A plan is being worked out whereby hog cholera serum will be manufactured; it is hoped this will make the piggery pay for itself.

Poultry yard.—The Rhode Island Red hens imported from the States were found to be suffering from tuberculosis. Those infected were separated and are being killed off to prevent spreading this disease among the healthy chickens.

Garden.—The garden has shown an increase in produce and income, although the expense has increased due to increased pay granted cripples, and increased number of cripples.

General.—With increase of patients the wards are becoming crowded, and steps will have to be taken to provide additional room. Several cripples have had their claims settled and have been deported to their native country. Many others are awaiting settlement of their claims. With the reduction of this force the garden will become self-supporting.

BOARD OF HEALTH LABORATORY.

On February 27, 1917, the laboratory staff moved into their handsome new building where excellent workrooms and a very complete equipment are provided.

The pathologist has continued during 1917 the examination of the large joints at all autopsies, and has published his results, which were summarized as follows:

1. Gross lesions of arthritis were found in 15.6 per cent of 1,100 consecutive autopsies and less than 1 per cent of those showing the lesions were considered "arthritis suspects."

2. All but two of the individuals showing arthritis were hard-working adults belonging chiefly to the negro race.

3. A chronic degenerative type of arthritis included 129 of the cases, while 43 cases were well known acute types of arthritis or some ill-defined acute and chronic types combined.

4. Chronic vascular disease (syphilis and arterio-sclerosis) and employment at hard labor are considered important etiological factors in the production of chronic degenerative arthritis.

5. The focal degenerative arthritis found at autopsy in young adults offers the gross pathologist, in the opinion of the writer, some additional presumptive evidence of syphilis and the application of the laboratory tests for the disease are indicated.

An attempt has been made to enlarge our knowledge of the parasites, particularly those occurring in the blood and muscles, of both wild and domestic animals in Panama. The pathologist has collected for publication in the Proceedings of the Medical Association of the Isthmian Canal Zone the observations thus far made at the laboratory on this subject.

The presence of Texas fever in this locality was first definitely established by the finding of *B. bigemina* in the blood of sick cattle in November, 1916. During 1917 further studies on this disease were carried out. Twenty-nine poorly nourished, tick-infested cattle from the Miraflores pasture were submitted for autopsy. Films from the blood, spleen, bone marrow, and brain were examined for the piroplasma with the following results:

	Positive.	Negative.		Positive.	Negative.
Brain	29	0	Spleen	8	21
Marrow	10	19	Blood	3	26

Thus it is seen that films made from crushed gray matter of the brain yielded far better results than blood films. An examination was then made of 125 healthy beef cattle at the Panama slaughterhouse, and all of them were positive for *B. bigemina*. A similar series of 150 beef cattle at the slaughterhouse in Cristobal showed 90 per cent positive. Since the cattle examined came from all the different Provinces of the Republic of Panama, it is safe to assume that the parasite is practically always present. These results were obtained from the brain films, blood films being negative. It is thus definitely established that, for this locality at least, the brain film is far superior to the blood film for diagnosis at autopsy. Panamanian cattle must be regarded as healthy "carriers" of the disease; imported nonimmune cattle quickly acquire the acute disease and

show a high mortality. Experiments have been begun toward immunizing imported nonimmune cattle by injecting them with a large dose (20 cubic centimeters) of the blood of native cattle soon after their arrival and not turning them out to pasture until they have passed through their mild attack of the disease.

By cultural methods it was shown that a large percentage of Panamanian beef cattle carry in their blood a large trypanosome. The morphology of the trypanosome was variable in the cultures and, as ordinary blood films were uniformly negative, a special method was developed to demonstrate the trypanosomes directly in the peripheral blood. The freshly drawn blood was defibrinated, laked with distilled water and centrifugated; smears from the sediment usually showed a few trypanosomes. The blood of the cattle inoculated into laboratory animals yielded negative, but a young calf showed numerous trypanosomes seven days after the inoculation. The trypanosome agrees with the descriptions of *Trypanosoma theileri* in morphology, in size, in its inability to multiply in other hosts than cattle, and in the fact that it can be readily grown in artificial culture media. We therefore decided that the trypanosome of Panamanian cattle is *Tr. theileri*. This organism is regarded by most authorities as being nonpathogenic. During the examination of the sediment of laked cattle blood after centrifugation, filaria were frequently encountered. Sarcosporidia were practically always present in films made from the heart muscle. Spirochaetes were encountered in two instances. It seems, therefore, that Panamanian cattle all harbor *B. bigemina* and sarcosporidium; that most of them are carriers of *Tr. theileri*, and many of them have filariasis; and that a few of them have spirochaetes in their blood.

Murrina has caused heavy losses during 1917 among the horses in the Sabanas between Panama City and Chepo. The laboratory conducted some field experiments on the treatment of the disease in a few horses; life was prolonged in most instances, but none of the treated horses survived. The experience gained will be useful in carrying out further experiments in the future. During the examination of the blood of the horses for trypanosomes, piroplasmata were encountered in several instances. An acute case of equine piroplasmosis in an American horse was encountered in the Canal Zone by Darling in 1913. It has been shown that the parasite occurs in Peruvian and Panamanian horses in this locality, and it is probably quite prevalent.

Hog cholera has continued during 1917 at Corazal farm in spite of the use of hog-cholera serum. It has been established by autopsy findings that Colombian hogs are susceptible to this disease.

During the year 12,543 Wassermann tests were performed on 9,561 persons, as compared with 8,633 tests on 6,728 different persons during the previous year. The results of these tests are summarized in the following table.

Wassermann reactions during 1917, based on the number of individuals examined and not on the number of tests made.

	Positive.	Negative.	Total.	Per ce positi
White, civil:				
Males	193	1,323	1,516	1
Females	20	144	164	1
Children	5	17	22	2
White, soldiers, males	273	2,214	2,487	1
Total	491	3,698	4,189	1
Spanish and white natives:				
Males	127	426	553	2
Females	15	81	96	1
Children	2	11	13	1
Total	144	518	662	2
Blacks and mulattoes:				
Males	1,238	2,536	3,774	3
Females	191	558	749	2
Children	10	164	174	
Total	1,439	3,258	4,697	3
Chinese, males	4	9	13	3
Grand total	2,078	7,483	9,561	2

In addition Wassermann tests were made on 214 spinal fluids fr as many individuals, and of these, 47, or 22.8 per cent, were p tive.

B. typhosus has been recovered in blood culture 25 times. Se of these cases came from shipboard (six different ships), two ca were recent arrivals from the United States, and the rest w sporadic cases from six different towns. None of the paratyph organisms were encountered during the year.

The following were also recovered in blood culture:

	Tim
Streptococcus	
Staphylococcus aureus	
Staphylococcus albus	
B. coli	
B. dysenteriæ (Flexnotype)	

During the year 1,576 cultures were examined for *B. diphther* and 300 positive cultures were obtained on 102 different individu One patient was detained in the hospital 71 days before negati cultures were obtained; 30 cultures taken during this time w positive.

The meningococcus was encountered in four cases during t year. In two cases the diagnosis was made by smears only, growth being obtained in culture media.

In the entomological department work has been carried on all branches of entomology throughout the year, and identifi

tions made of insects belonging to all orders. Although the principal lines of investigation that have been conducted in this department were in connection with medical entomology, many observations have also been made along the lines of agricultural, economic, and general entomology, as the calls on the laboratory demand.

There were 240 lots of mosquito larvae received during the year and identified. Several samples of flour were examined for insects attacking stored products. Observations were made on the oviposition habits of *Culex* and *Aedes* mosquitoes. Studies are being made on the house fly, *Musca domestica*, in Panama, and new and interesting data regarding their habits of oviposition have been secured which will be reported fully at a later date. Observations on the life history and habits of the biting fly, *Stomoxys calcitrans*, are also being made. Investigations are being carried on regarding the insect transmission of *Murrina*, the trypanosomal disease of horses, to determine if biting insects act as intermediate hosts. A number of adult mosquitoes of various species were received during the year for identification. An adult female *Anopheles* previously unreported from the Canal Zone, was discovered this year. This is *Anopheles hylephilus*, the larvae of which undoubtedly live in the water held at the bases of the leaves of Bromeliaceous plants. Specimens of two new species of ticks have been found on the Isthmus, which have not been previously reported from this locality—one of these species, *Amblyomma humerale*, was found on a tortoise; the other, *Ixodes ricinus*, accepts man as a host as well as various wild and domestic animals.

Work on the census of the adult mosquitoes taken in the daily hand catches in quarters and barracks at the various line stations, military posts, etc., which was continued throughout 1916, was completed in February, 1917. During the two months of the present year that this work was carried on, 20,835 mosquitoes were examined and identified. Of this number there were:

Anopheles albimanus	1,108
Anopheles tarsimaculata	2
Anopheles punctipennis	53
Anopheles malefactor	10
Anopheles apicimacula	1
Anopheles eiseni	4
Mansonia titillans	15,021
Mansonia nigricans	342
Mansonia fasciolatus	916
Aedes (Stegomyia) calopus	14
Aedeomyia squamipennis	4
Lutzia allostigma	1
Lasticocampa	16
Wyeomyia	40
Culex and allied genera	3,358

A complete report of this mosquito census has been prepared for publication. This report describes the habit of adult mosquitoes in entering habitations, explains the practical value of hand catching as a prophylactic measure against malaria, and the method of hand catching.

Observations on the screw worm fly, *Chrysomia macellaria* (*cochliomyia desvoidi*), were continued during the first half of the year

and an extended report on this obnoxious and dangerous fly was completed and read before the Medical Association of the Isthmian Canal Zone. This report consists of notes on the early history of the fly, its distribution throughout North, Central, and South America, its life history in Panama, including copulation and oviposition, its manner of attacking man and both wild and domestic animals and the injury caused by such attacks, the effect of sunshine, water, heat, and cold on the immature stages, the habits of the larvae in burrowing into the ground to pupate, the depth necessary to bury carcasses to prevent the breeding of this fly, the lethiferous effects of various drugs and chemicals on the larvae, and preventive and control measures against this pest. This very complete report required extensive observations on this fly.

Studies on the lake mosquito, *Mansonia titillans*, and its host plant, the water lettuce, Pistia stratiotes, were continued at intervals during the year, and an article on the subject prepared for publication. This article consists of data regarding the corresponding increase of both the mosquito and water lettuce with the formation of Gatun Lake, the habits and development of the different stages of *M. titillans*, the prevalence of the adults and their attacks on man, their manner of biting, and seasonal prevalence. Data on the water lettuce explain the history and distribution of the plant, a description of the plant, information regarding its propagation and development, suggestions for its control, and notes on the insect enemies of the plant. Additional studies on the water lettuce will be carried on from time to time, with the view of discovering an economical and practical method of eradicating the plant and its associated mosquito.

Evidence has been received which leads to the suspicion that ticks are possibly concerned in the distribution of the eggs of Dermatobia hominis (*Dermatobia cyaniventris*). Studies have been made in connection with this infestation of the larvae of this fly, and a report has been prepared for publication which contains the evidence submitted and the findings of our observations.

Extensive studies on the iguana tick, *Amblyomma dissimile*, the common ecto-parasite of snakes, toads, and iguanas in Panama, were completed during the year and an article on the subject prepared for publication. This paper deals with the description of the different stages of the tick, the periods of attachment, molting, preoviposition, oviposition, and its attacks on reptiles and batrachians.

The study of the snakes found in the Canal Zone and Panama was continued during the year and a number of specimens were secured by gifts from individuals and by purchase from natives. Two species of venomous snakes were added to our collection during the year, of which we have not had specimens heretofore. Of the number secured alive during the year, three were poisonous species of which we have not previously been able to secure living specimens. The possession of these three venomous species afforded us an opportunity to experiment with their venoms in continuation of our studies on the toxicity of the venoms of the serpents of Panama. The first of these three species was a fine

specimen of the "Yellow-bellied sea snake," *Hydrus ploturus*. This specimen, which measured 26 inches in length, 1½ inches thick laterally, and 1 inch wide dorsally, was allowed to bite a guinea pig weighing 425 grams. Its action in biting was very similar to the coral snake, *Elaps fulvious*. The act of biting lasted 40 seconds and a chewing motion of the jaws occurred throughout the period. The pig evidenced no symptoms until four minutes after the bite, when it suddenly fell over on its side, the respiration changed to short weak gasps, and two minutes later the pig was dead. In experiments with the venom it was found that 0.0015 gm. of liquid venom diluted with 1 c. c. of normal saline solution and injected subcutaneously into a guinea pig weighing 508 grams, caused paralysis in 10 minutes and death in 14 minutes. One extraction of venom from this snake produced 0.0038 gm. of liquid venom. While securing the venom it was noted that as soon as the snake began biting on the edge of the extraction dish the venom was ejected from the fangs in fine streams of minute volume. The fresh venom is quite viscid, but entirely colorless like water. It is neurotoxic in effect. Animals that were bitten by this snake or received injections of the venom manifested no swelling, discoloration, or other changes at the site of the bite or injection, and the autopsies showed no gross pathological changes. We find that the *Hydrus platurus* is the most highly poisonous of any of the Panama snakes we have studied to date. This species lives in the Pacific and Indian Oceans, where it may be encountered in large numbers, sometimes being found in schools numbering thousands of individuals. It is commonly known among the natives of Panama as the "Toboba" and is very common along the Pacific coast of Panama and the adjacent islands. It is rather sluggish in disposition and does not appear to be very vicious.

Experiments were also made with the venom of the "Fer-de-lance," *Bothrops atrox*. This snake was 4 feet and 2 inches in length; the body was rather stout, being about 1½ inches in diameter and with a ridge along the median dorsal line which gave somewhat of a triangular appearance. The head was 2 inches long, 1½ inches wide at its broadest part, and rather flattened, being about three-fourths of an inch thick and ending in a pointed snout. The tail which was about 7 inches in length, tapered finely to a small tip. This snake was allowed to bite a guinea pig weighing 410 grams. It struck the pig with great rapidity and the bite lasted less than three seconds. Owing to being confined in small quarters the snake was handicapped in its striking and but one of the fangs entered the pig to inject venom. This was at the right fore shoulder. The other fang ejected its venom over the hair of the pig on the outside, consequently the venom of but one fang was received by the pig. Within 15 minutes after being bitten the pig began to show signs of pain and excitement. At the end of 25 minutes the shoulder that was bitten became greatly discolored and was so badly swollen that it was apparently helpless. This swelling and discoloration, accompanied by the sloughing of the hair and skin with profuse oozing of serum, gradually increased until 3 hours and 15 minutes after the bite, when the death of the pig occurred. It was autopsied

and much discoloration with extensive hemorrhage into the tissu
was found in an area surrounding the right fore shoulder and e
tending across the breast and involving the left fore shoulder.
considerable amount of serum was present between the skin a
the muscular coat. A guinea pig weighing 415 grams which w
injected with 0.0130 gm. of liquid venom from this snake died
9 hours and 40 seconds. The amount of liquid venom ejected
one bite by this snake was 0.0728 gm. This venom is hemorrhag
in action and, although not extremely rapid in its action, is ve
lethal in effect. This species belongs to the group known as p
vipers, all of which are highly poisonous.

A specimen of a second pit viper was also received alive. Th
was a *Bothrops lansbergii*, 19 inches in length and seven-eighths
an inch in diameter. The bite from this snake killed a lar
mouse in a very few minutes.

CHRONIC WARD.

An average of 27 patients were constantly cared for in this wa
during the year, at a daily per capita cost of $0.252.

COLON HOSPITAL.

There were 2,036 patients admitted to this hospital during t
year, as compared to 1,700 for 1916, and 2,129 for 1915. T
average number of patients constantly in the hospital during t
year was 50, as compared with 37 for 1916.

The new garage, recently completed and turned over for use,
occupied by quarantine, Colon health office, and hospital amb
lances, with quarters above for respective chauffeurs. There is
fourth space to take care of an additional ambulance for Col
Hospital.

The quarters for doctors and internes were completed in Ap
and turned over for occupancy. They are satisfactory in eve
way.

With the completion of the morgue and addition of the ne
autopsy table we were able to have the old morgue and chap
torn down. It was found necessary to retain the stables to hou
the mule ambulance.

The new quarters for nurses are rapidly nearing completion a
should be ready for service in about two months. The finishi
of the nurses' quarters will allow the tearing down of the remaind
of the old hospital, which is not only unsightly but obstructs s
breezes to the hospital.

In April a dry fill and grade of the hospital grounds was ma
and since then much has been done to improve them. The plan
and shrubs recently obtained from Ancon have been set out a
give promise of thriving nicely. Early in the year a concre
sidewalk with curb and gutter was constructed on Second Stre
from Coconut Alley to service road.

The increase in personnel in 1917 was as follows: Internes,
nurses, 3; artisan, 1.

Palo Seco Leper Asylum.

The average number of patients constantly cared for during the year was 65.69. There were 66 patients under treatment at the beginning of the year; 11 were admitted, 7 died, and 3 were discharged, leaving 67 remaining in the asylum at the end of the year.

A new building, one story high, 28 by 72 feet, containing 6 rooms, each 12 by 16 feet, and 2 bathrooms, 2 toilets, and front and back porch extending the length of the structure, was completed during the year. All the work on this building, with the exception of the electric wiring, was done by patients of the institution. The building is used as quarters for male West Indian patients, and helps relieve the present congested conditions. The chapel was moved a distance of 35 feet and placed on a direct line with other buildings. The space formerly occupied by the chapel was graded and planted with grass and flowers.

During the year the municipal engineering division made water connection from the asylum pump to the military substation and a tank was erected by the fortification division of 50-barrel capacity for the use of the military substation. Water was supplied to this substation commencing in May, continuously, with the exception of about three weeks when the well at the asylum appeared to be running dry. The plunger and casing were lowered 50 feet, making the total lift of the pump 138 feet.

A foundation of rock and stones was laid during the year as a new site for the laundry, placing this building on a direct line with other buildings. Minor repairs were made on all buildings during the year by patient labor, who also built tables and benches for asylum use.

About 35 acres of land were under cultivation during the year by patients, and all products were sold by them to the asylum. Approximately 9,000 pounds of yams, 1,400 pounds of yucca, 800 pounds pumpkin, 500 pounds cucumbers, 600 pounds tomatoes, 200 pounds okra, 500 dozen ears of green corn, 12,000 plantains, and 300 dozen eggs were purchased from the patients at a total cost of $616.49.

Articles to the amount of $1,509.48 were sold from the commissary to patients during the year. All articles are sold at cost, and at a loss to the department, as the cost of transportation and handling of these extra supplies required to be carried in stock amount to about 10 per cent, and it is recommended that authority be obtained to charge 10 per cent above cost price to cover this loss.

Authority was obtained from the governor in October for the expenditure of $1,400 for the building of a new launch, 7 by 28 feet, and a work request was placed on the mechanical division October 26. This launch at the close of the year was 95 per cent completed.

All rocks and stones around all patients' quarters and in the park in front of the administration building were removed during the year, and the ground graded and planted with grass by asylum labor.

Motion-picture shows were given weekly until June, when d to the fact that boat service was uncertain, it was impossible secure an operator to run the machine; and to return the reels the Y. M. C. A. at a fixed time. Reels were furnished the asylu by the bureau of clubhouses, and this division also gave the asylu 70 books of fiction. At the motion picture shows, ice cream a cake are served to the patients.

Services for the Protestant patients were held weekly duri the year by the chaplain from Ancon Hospital. Occasion services for the Catholic patients were held by priests from Panar and the Canal Zone.

At the close of the year 63, or 94 per cent, of the patients we taking chaulmoogra oil. Marked improvements in a number cases is shown and accurate records of the results of the treatme are being kept.

The general health of the patients remains good; three cases malaria occurred during the year, two among patients, and one a new employee. Antimalarial work continued during the ye

Santo Tomas Hospital.

Ten thousand five hundred and fifty-one patients were admitt during the year, as compared with 10,831 for 1916, and 11,283 f 1915. The average number of patients constantly in the hospit was 440, as compared with 447 for 1916.

District Dispensaries.

Seven dispensaries, including those at Ancon and Colon h pitals, have been maintained during the year.

At Ancon Hospital, the new admitting office and dispensa was occupied on May 8, 1917. It is a two-story concrete buildi with offices, waiting and examining rooms, drug store, and dentis rooms. Quarters for the physicians, druggist, and attendan are provided on the second floor.

A new concrete dispensary building was also erected at Ped Miguel, which was occupied on December 31, 1917. It provid offices for the district physician, district sanitary inspector, a district dentist, and on the second floor has living quarters for t gold employees of the dispensary.

A new concrete dispensary building is under construction Gatun, and will be completed during the coming year. This w provide for up to date offices for all our district physicians wi the exception of Paraiso, which in time is to be abandoned; a at Gamboa, which does not require a resident physician.

The annual physical examination of school children of the Zon conducted by the district physicians, was begun in October, 191 The following table shows the result of the examination of the whi school children:

Number examined	1,3
Number found needing treatment	6
Percentage of those examined needing treatment.....per cent	
Number with defects of teeth as only defect	3

Number with defects other than those of teeth only	338
Defects found	790
Defective vision	77
Defective hearing	11
Defective nasal breathing	32
Hypertrophied tonsils	167
Pulmonary disease	5
Bronchitis	3
Chorea or other nervous defects	4
Orthopedic defects	3
Malnutrition	2
Defective teeth	441
Contagious disease	5
Enlarged cervical glands	27
Cardiac disease	13
Number of cases treated and treatment reported	164
Number vaccinated	159
Number of successful vaccinations reported	89

The number found needing treatment includes all children in which there was even a suspicion of a diseased condition. The number of cases reported as treated is not complete, due to the fact that many notices were ignored by parents, and many slips to be returned to the examining physician, showing that treatment was given, were lost or misplaced.

The children in the colored schools were also examined, and treatment recommended where necessary.

DIVISION OF SANITATION

Zone Sanitation.

The zone sanitation activities have been directed chiefly toward malaria control and antimosquito work. The infrequency of other diseases of a communicable nature, within the limits of the zone, has been such that no extra effort has been required of this department during the past year.

The extensive activities of the supply department in clearing land for pastures and plantations which have made necessary the establishment of numerous camps outside of the regular sanitated areas has been responsible for 173 of 473 cases of malaria among employees reported during the year 1917. Of the remaining 300, 177 were from Colon-Cristobal and Panama, leaving 36 for dredges, etc., and 87 for the zone proper.

The presence of the cattle in pastures which have limits extending to within the distance of maximum flights as determined for anopheles mosquitoes, introduces a new problem in mosquito control. Will the anopheles feed exclusively on the blood of cattle, or will they only feed sufficiently to encourage propagation and then seek their choice meal of human blood and thereby intensify their efforts in spreading malaria? The observations during 1918 will probably furnish data on this point.

The amount of permanent improvements of a sanitary nature, and a corps of sanitary inspectors of a very high grade of efficiency, will mean a still greater reduction in the malarial rate for the coming year. Methods of reducing the cost, without reducing quality and quantity of new work, have been submitted; if approved,

they will facilitate the improvement of even the present hig standards of sanitation on the Canal Zone. The hydraulic fills i the Ancon-Corozal district are nearly completed, and should sho a reduction of mosquitoes in the areas affected.

The general health conditions of the zone have been goo throughout the year, with the exception of the epidemic of measl in the Balboa district.

Panama City.

Malaria.—In years past malaria has been one of the great san tary problems in Panama, and for that reason it is here mention first. As a matter of fact, this disease no longer presents any gre problem, as its control simply means a matter of drainage ditch and oil. The year 1917, with a total of 187 cases as against 2,1 cases three years ago, shows how effectively the problem has be attacked.

With the extension of new ditches and the work of maki permanent ditches out of those already constructed, even t amount of oil necessary is much less than in former years.

Approximately 10,000 linear feet of new ditches were construct during the year, so that now our drainage system totals about 160,0 linear feet. Over half of the ditching work for the entire year w done during November and December.

How effective our measures have been is shown by the followi table:

Cases of malaria chargeable to Panama.

1914	2,
1915	
1916	
1917	

Tuberculosis.—While malaria has steadily and very rapid decreased from year to year, tuberculosis has slowly but steadi increased, until at the present time over one-sixth of the tot deaths from all causes are caused by this disease. The total nu ber of deaths from tuberculosis for the past four years is submitte

Number of deaths from tuberculosis.

Year.	Pulmonary tuberculosis.	Other forms.	Total deaths.	Rate p 1,000 popul tion.
1914	206	23	229	3.
1915	210	35	245	4.
1916	242	71	313	5.
1917	253	66	319	5.

A survey of economic and building conditions was made duri the last four months of the year, and in so far as it is possible ste have been taken to remedy the principal conditions believed be responsible for our high tuberculosis death rate.

Two glaring features stood out above all others, poverty and the overcrowding and lack of ventilation in the tenement houses of the city. The overcrowding is due, of course, to both low wages and high rents.

Already measures have been taken to improve the living conditions in the tenement houses by notifying owners to install lattice windows, cut out dark rooms, and make such other changes as are necessary to improve the present poor system of lighting and ventilation. Forty-four different houses had undergone such improvements up to December 31, 1917.

A still better antituberculosis measure would be the building of sufficient silver quarters on the Zone for the housing of the employees now residing in Panama. This would reduce the population of the city greatly and there would then be room enough to prevent overcrowding among the remainder of the inhabitants. Lower rents would also result.

During November and December several educational articles on "Prevention of tuberculosis" were published in the local press, and plans were completed whereby, beginning with the New Year, all cases of tuberculosis in the city would be visited and instructed by a public-health nurse attached to this office.

Infant welfare work.—Late in 1916, because of the high infant death rate, a public-health nurse was added to the personnel of the Panama health office, and by the beginning of 1917 her work was well under way. During the year she made 14,165 visits and gave instructions to 700 mothers in the care of their babies.

For the first half of the year there was no appreciable difference in the usual number of infant deaths, but in the latter months the decrease was sufficiently marked to indicate that results were being secured.

The Panama National Red Cross Society, a native organization, also took up this work early in 1917 and conducted it along the same lines as originally outlined by the visiting nurse attached to this office. By the end of the year their work was so well organized that it was decided to turn over to the National Red Cross Society all infant-welfare activities in Panama, which was done December 31, 1917.

Though the infant mortality rate is slightly higher than it was a year ago it would doubtless have been very much higher if no infant welfare work had been done because of the increased cost of milk as well as practically all foods.

Infant mortality for past three years.

1915—221.00 per 1,000 births reported.
1916—236.86 per 1,000 births reported.
1917—237.73 per 1,000 births reported.

Hookworm infection in employees.—Examinations were made in November to determine the percentage of hookworm infection among our silver employees. As a result of these examinations it was shown that over 40 pre cent were positive. Because of this high percentage of infection among about 130 laborers, and with

they will facilitate the improvement of even the present hi standards of sanitation on the Canal Zone. The hydraulic fills the Ancon-Corozal district are nearly completed, and should sh a reduction of mosquitoes in the areas affected.

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Already measures have been taken to improve the living conditions in the tenement houses by notifying owners to install lattice windows, cut out dark rooms, and make such other changes as are necessary to improve the present poor system of lighting and ventilation. Forty-four different houses had undergone such improvements up to December 31, 1917.

A still better antituberculosis measure would be the building of sufficient silver quarters on the Zone for the housing of the employees now residing in Panama. This would reduce the population of the city greatly and there would then be room enough to prevent overcrowding among the remainder of the inhabitants. Lower rents would also result.

During November and December several educational articles on "Prevention of tuberculosis" were published in the local press, and plans were completed whereby, beginning with the New Year, all cases of tuberculosis in the city would be visited and instructed by a public-health nurse attached to this office.

Infant welfare work.—Late in 1916, because of the high infant death rate, a public-health nurse was added to the personnel of the Panama health office, and by the beginning of 1917 her work was well under way. During the year she made 14,165 visits and gave instructions to 700 mothers in the care of their babies.

For the first half of the year there was no appreciable difference in the usual number of infant deaths, but in the latter months the decrease was sufficiently marked to indicate that results were being secured.

The Panama National Red Cross Society, a native organization, also took up this work early in 1917 and conducted it along the same lines as originally outlined by the visiting nurse attached to this office. By the end of the year their work was so well organized that it was decided to turn over to the National Red Cross Society all infant-welfare activities in Panama, which was done December 31, 1917.

Though the infant mortality rate is slightly higher than it was a year ago it would doubtless have been very much higher if no infant welfare work had been done because of the increased cost of milk as well as practically all foods.

Infant mortality for past three years.

1915—221.00 per 1,000 births reported.
1916—236.86 per 1,000 births reported.
1917—237.73 per 1,000 births reported.

Hookworm infection in employees.—Examinations were made in November to determine the percentage of hookworm infection among our silver employees. As a result of these examinations it was shown that over 40 pre cent were positive. Because of this high percentage of infection among about 130 laborers, and with

the knowledge we have concerning the decrease in efficienc this disease occasions, more extensive examinations of employe will be made.

Principal infectious diseases occurring in Panama during 1917.

Diarrhea and enteritis, including colitis (deaths)	3
Pneumonia, lobar and broncho- (deaths)	2
Chicken pox	
Pertussis	
Measles	
Diphtheria	
Scarlet fever	
Typhoid fever	

Vaccinations.—The total number of vaccinations for the ye was 1,447, and these were all done during June, July, Augu and September.

Regulation of midwives.—In 1916 a section was added to t sanitary regulations requiring the licensing and supervision midwives by the health office. At the present time there a over 60 women in this profession registered in Panama in acco ance with this requirement. However, as there is no penal clause provided, births are not infrequently attended by u licensed midwives. As most of these women have failed to me all the requirements, there should be a provision whereby su incompetents could be eliminated.

Work of the veterinarian.—On June 9, 1917, a veterinarian w added to the personnel of the Panama health office. Because the government regulations requiring the disinfection of hid and a requirement that all hogs and cattle shipped through Pana be inspected, such an official was found to be necessary.

The veterinarian has divided his time between the supervisi of hide disinfection, the inspection of animals, and meat insp tions in the local markets. Since August, 1917, he has al devoted as much time as possible to food and dairy inspectio in addition to his regular duties.

The following is a brief report of the work done by the vete narian from June 9 to December 31, 1917:

Hides disinfected	12,
Goatskins, deerskins, etc., disinfected	2,
Hogs and cattle inspected	10,
Inspections of markets, etc	
Diseased animals treated	
Horses condemned as unfit for service	
Dairies inspected	
Hotels and restaurants inspected	
Bakeries inspected	

Stables.—Several stables were abolished as sanitary nuisanc and those still remaining are maintained in sanitary conditio Manure is removed daily to the city dump, so that there is no breeding at the stables.

Disposal of manure.—All manure remaining within the city taken care of at the dump. It is placed in piles about 6 feet hi and 20 feet in diameter. The sides and edges of these piles a covered with paper, shavings, or other inflammable materi

which is then burned. However, during the night, or in times of heavy rains, these fires die out and many of the larvæ escape to finish their cycle of development in the ground surrounding the manure piles.

Milk, dairies, bakeries, bottling works, candy kitchens, hotels, restaurants, etc.—After the resignation of the food and dairy inspector in August the inspections of these various places were carried on by district inspectors and the veterinarian. Under the circumstances it is not possible to make a complete report of this work, or to give tables, but an effort was made to at least keep the hotels, restaurants, and bakeries in a sanitary condition at all times.

Building inspection.—Because of the increased cost of materials the number of new buildings has not been large, but inspections of old buildings and the work of supervising repair work has gone on regularly. During November and December there was most unusual activity in this branch of our work due to the beginning of an extensive antituberculosis campaign.

Sanitary nuisances abated.—The total number of nuisances abated for the year was 3,440. Fines amounting to $497.55 were imposed. As many nuisances were committed by poor people, a policy of great leniency was followed, and fines, when imposed, were minimum. A very effective way was to impose a fine, say, of $5 and then suspend it pending the subsequent good behavior of the offender, and it was seldom found necessary to collect the fine.

Street cleaning.—This work has been carried on, as in the past, by street sweepers with push carts under the supervision of street foremen in the various districts. By the present system the streets are kept in excellent condition.

Garbage collection and disposal.—Practically all garbage is collected during the morning, and throughout the entire year it has been disposed of at the city dump. However, after the beginning of the new year all this material will be burned at the new incinerator, which is now completed. No special comments on garbage disposal are necessary, as the work has been carried on in the same way as for the previous year.

Colon–Cristobal.

Large permanent improvements have been made in the district during the past year. The principal one was the completion of New Cristobal, involving the filling in of about one-half of the large swamp between G Street and the beach and Ninth Street, as well as the fill immediately behind the wireless station, the latter being of very practical utility since it eliminated a long standing source of possible anopheles mosquito breeding which had to be kept oiled all the time. The open ditch along G Street has been converted into a concrete storm sewer into which the remaining part of the swamp is drained. The sewer system in this part of Colon was changed and carried out in the bay in front of the quarantine station, thus affording a clean beach in front of New Cristobal.

ship *Advance*. The last case was reported on December 11, and it is believed that the disease from that source is completely under control.

Anthrax.—At present the sale of meat infected with anthrax is prevented by measures instituted during the last calendar year. Every animal slaughtered has its spleen examined for the anthrax bacillus. All animals imported are inspected by the veterinarian and killed and their carcasses incinerated if found infected. Some of the pastures now being used are known to be infected with anthrax; while the measures taken will probably preclude the danger of human infection, it is recommended that whenever the infection of a portion of a pasture with anthrax may be defined, that portion be fenced off and withdrawn from use.

Mosquito incidence.—The mosquito catch in Colon-Cristobal and Camp Bierd has indicated a fall in the mosquito incidence. During the middle of the rainy season there were noticed a number of flights of anopheles and culex which originated across Folks River and caused a temporary rise in the malarial rate as well as much annoyance in the northeastern part of Colon. Steps are being taken soon to reduce the mosquito breeding in the region from which these flights came. There has always been considerable breeding of *tineorynchus* in the swamps in east Colon, especially in the numerous crab holes there. It has not been practicable to eliminate these crab holes mosquitoes by oiling methods, although oil has been used to reduce the amount. The progressive filling of these swamps will probably eliminate this source of annoyance.

There has also always been a certain amount of breeding of *aedes calopus* in the containers at the garbage dump in Colon; the method in use there has made it impossible to eliminate all this breeding except at prohibitive expense. The building of the new incinerator, however, will put an end to this source of the *stegomyia*, and there ought not to be thereafter any more of these mosquitoes in the district.

Flies.—The close of the year witnesses an almost irreducible minimum in fly incidence in Colon. In the early part of the year an effort was made to economize in the use of larvacide and the custom of using a small quantity of larvacide on inaccessible cracks and crevices in the cleaning of patics and premises was temporarily discontinued, with the result of an increase in the number of flies, to the extent that it was decided to resume the use of larvacide as before, which soon got rid of the flies again. This use of larvacide both destroys adult flies and prevents fly breeding in places where mechanical cleaning can not be made thorough. The effort is to reduce the number of these places by requiring buildings to be kept in repair and by a complete reduction of defects in concrete work, but until this is brought to a very high standard of perfection a limited use of larvacide is highly advisable. One thousand gallons of larvacide per annum will probably almost eliminate flies in the city, in addition to the present stringent regulations applying to stables and corrals.

Rats.—Many old buildings in Colon have been brought up to the requirements of the regulations in reference to rat proofing in the

course of the year. The elimination of the old buildings on the water front, the filling in of holes in the coral rock on other beaches, which are a harboring place for rats, and the constant killing and poisoning have reduced the rat infestation in the district, and it is believed that the reduction is much faster than the increase, with the probable outcome that Colon and Cristobal may be completely free from rats when the prospective improvements are completed.

On the completion of the modern cold storage plant at Mount Hope, the rat infested plant now in operation at Cristobal will be eliminated and the building used for other purposes, after it has been freed from rats by the demolition of Dock 11, which is the source of rodent breeding in Cristobal. The new cold storage plants will probably be completed within the next eight months.

Hotels, cafés, and markets.—A new and modern concrete hotel was built and put into commission in Cristobal during the year, replacing the old wooden building which has been a subject of frequent complaint of late years. A large new concrete hotel for Colon is nearing completion at Bolivar and Eighth Streets, which will be a decided improvement in the accommodations of that sort in the city.

Continuing the policy of bringing cafés and restaurants up to a high standard, upon which the health office has been working steadily since the completion of the canal, several of them were closed and others made to conform with the regulations. A number of improvements were made in the public market in Colon, but it is probable that additional market facilities will have to be provided for that city before long, and it is desirable that this should be located on a water front.

Piers and docks.—Pier No. 7 was completed and put into commission during the calendar year. Pier No. 6 is well on the way toward completion. Pier No. 11 is in the same unsatisfactory condition as previously reported, but it will doubtless be remodeled as soon as conditions permit. Pier No. 4 has been remodeled and made available for the use of the schooner trade.

The docks are inspected thrice weekly, and the work of catching rats is carried on daily, although the improved condition of the piers has reduced the rat catch to almost a negligible point.

Building operations.—The three large areas devastated by fire within the last two and one-half years have been almost completely rebuilt with concrete structures, with the exception of a part of one block in front of the Government Palace. In addition to this many vacant lots in various parts of the city have been improved during the year, the most notable of which has been the one at Broadway and Third Street, where a handsome row of cottages has been erected. There has been considerable deterioration in the case of many of the older wooden buildings in the Slifer Park section of Colon, and it is probable that some of these buildings may have to be condemned during the next year.

Schools.—Schools and school children in the district are periodically inspected. There is an annual physical examination of all pupils in the Zone schools made by the office of the district physician. Children in the Panamanian and private schools are

not subject to the same examination and it is planned to have thi done through the cooperation of the Panama Government.

All school children in the district have been vaccinated agains smallpox. There has been no epidemic in or traceable to th schools in the past year. The construction of the new concret Cristobal school building has been of marked benefit. Its locatio in a quieter part of the district than the old schoolhouse ought t result in better health in the pupils and teachers. The exposure small children to the heavy rains in going to and from the publi and private schools in the rainy season is not the most desirabl from the point of view of their health. It is hoped that som system of reducing this exposure can be worked out.

General sanitation.—Control over the bringing of infectious di cases into the district from points on the coast of the Republic Panama will be facilitated by concentrating the schooner an cayuca traffic at definite piers provided for that purpose, an it is desirable that these piers should be provided with amp facilities for the temporary storage, the inspection and handlin of produce brought into port in these small vessels. It has som times happened that *stegomyia* mosquitoes are brought into Col by these vessels, while infected persons from interior points ma sometimes also get into the city in like manner. A more sati factory and comprehensive manner of dealing with this branch sanitation here ought to be worked out before the traffic assum such proportions as to magnify the difficulty of handling it.

Veterinary department.—The ante and post mortem inspections all food animals is an important factor in the maintenance of publ health, as it not only assures the consumers a wholesome me supply but it also protects them against those diseases of anima that are transmissible to man.

An important change during the past year is the present separ tion of the handling of edible and inedible products, or the remov of objectionable processes from the rooms where edible produc are handled at the time of slaughter to distinctly inedible room

During the coming year it is hoped to extend the scope of th work so that the handling, salting, curing, and preparation of meat products shall be under the observation of a compete employee of this department whose duty it will be to see that meat and meat products are handled in a sanitary manner from t time of slaughter until ready for delivery to the consumer. Th employee will give especial attention to the cleanliness of produc entering into the manufacture of sausage, lard, and cooking co pounds; the cleanliness of equipment, the sanitary condition employees' clothing, and see that meat of all kinds are stored a held under reasonably sanitary conditions.

We also recognize the necessity of improving the conditions und which meats are handled in Colon, especially in the slaughterhou where the handling of edible parts on clean tables will be a gre improvement over that of the present method of using the floor.

For the production of anti-hog-cholera serum on the Isthmus, number of hogs have been selected and given the simultaneo treatment, with the end in view of using them within a sho time for hyperimmunization.

QUARANTINE TRANSACTIONS.

A résumé of the quarantine operations for the year just ended shows that the quarantinable diseases of plague and yellow fever have not materially changed, with particular reference to Central and South American ports. Along the west coast the first part of the year plague conditions were bad, particularly in Guayaquil, with a high mortality rate. An extension of the disease has occurred in Ecuadorean ports north of Guayaquil, which has been made the subject of reports from time to time, and requires very careful consideration from the standpoint of a farther northward extension to Colombian ports, which would make the disease relatively a very short distance from the Canal Zone. So far as we are aware, however, this disease has not made its appearance in Colombian ports up to the present time.

In Peru and Chile, general plague conditions have shown little variation. The infection is very generally disseminated, and no measures of any special benefit have been carried out for its eradication.

Yellow fever on the west coast has been more prevalent in Guayaquil, Ecuador, than elsewhere, though the seasonal increase of this disease at that port, looked for in the last few months, has not been as extensive as expected.

In Buenaventura, Colombia, toward the latter part of the year a consular representative, who also looks after the matter of fumigating ships, has been stationed, which arrangement will be more satisfactory from the standpoint of shipping between the canal and this port.

Smallpox has been quite prevalent in Chile and Peru, and has been reported as having a higher virulence than usual. Since the first of the year, and even earlier, considerable trade has developed between Ecuadorean ports and Panama, carried on in small schooners. Careful watch is being maintained of this traffic, in order to guard against yellow fever, smallpox, and plague, and when considered necessary these vessels are detained and fumigated.

On the Atlantic side plague is reported in Brazil, and we suspect its presence in Venezuelan ports also.

Yellow fever is reported from time to time as being endemic in certain places in Venezuela, and the shipping calling at Venezuelan ports is watched on account of both this disease and the possibility of plague being present. Yellow fever has also been reported in Brazil and from some of the West Indian Islands. This disease has also shown considerable prevalence in Mexican ports, particularly in the vicinity of the Yucatan Peninsula; the vessels, however, sailing from these ports to the canal are inspected by public health service officers, and as a rule consume more than six days on the voyage to the canal.

From time to time the question of modifying our quarantine regulations against ports on the Colombian coast, particularly on the Atlantic side, has been brought up, but due to the condition of these ports and the inability to get complete and accurate data,

it has not been considered advisable to further reduce our quarantine which is believed to be already the minimum procedure consistent with safety.

In February, 1917, the new immigration law was made effective, which is embodied in governor's circular 601–61. Governor's circular 714 charges the division of quarantine with the duty of carrying out the above-mentioned executive order relating to the exclusion of undesirable persons. The application of this law has done much to remove from the Isthmus and to prevent the landing upon the zone of undesirable persons. The police and customs forces of the canal have given material assistance in the application of the law. During the year 360 immigrants falling in the undesirable class were rejected and deported.

The work of the veterinarians in connection with quarantine and ante and post mortem inspection of food animals has been carried out in a very careful manner, with particular reference to anthrax. During the month of March, 1917, a total of 15 deaths from anthrax occurred among cattle belonging to the supply department. One of these cases occurred on the floor of the Cristobal abattoir, and was made the subject of special report. The statistical reports of the quarantine and ante and post mortem inspection of food animals, and disinfection of hides by immersion in 1–1,000 bichloride solution for 24 hours, are as follows:

Quarantine inspections:	
Cattle	28,675
Swine	5,874
Sheep	76
Goats	4
Ante and post mortem inspections:	
Cattle	17,094
Swine	6,531
Hides disinfected	24,806

The supervision of veterinary work was transferred to the health officer of Cristobal-Colon on December 5, 1917, in order to consolidate this work under one head. On November 21, 1917, governor's circular 700–1 was issued, requiring application of tuberculin test to all cattle and hogs imported into the Canal Zone for dairy or breeding purposes, and to such animals arriving in Canal Zone ports for transshipment to other points when considered necessary, unless such animals are accompanied by a health certificate including tuberculin test chart executed by an inspector of the United States Bureau of Animal Industry. This requirement was for the purpose of preventing the introduction of tuberculosis among domestic animals on the Canal Zone. The examinations by the health department veterinarians have shown that this disease practically does not exist among the domestic animals of this locality, while on the other hand its prevalence among domestic animals in the States is very high. The method of administering the test is outlined in the circular, and is subject to change from time to time in the discretion of the chief health officer.

DEPORTATIONS.

ixty-six employees were repatriated to their homes during the r, 57 of whom were incapacitated by mental or other diseases, the remaining from injuries received in the course of their ›loyment. Thirty-four nonemployees were also repatriated, all 'hom were suffering from disease excepting 2.

ı addition to the above deportations accomplished by the ›itals, 360 passengers on incoming vessels were detained and orted by the quarantine authorities.

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ADMISSION RATE PER 1000 EMPLOYEES

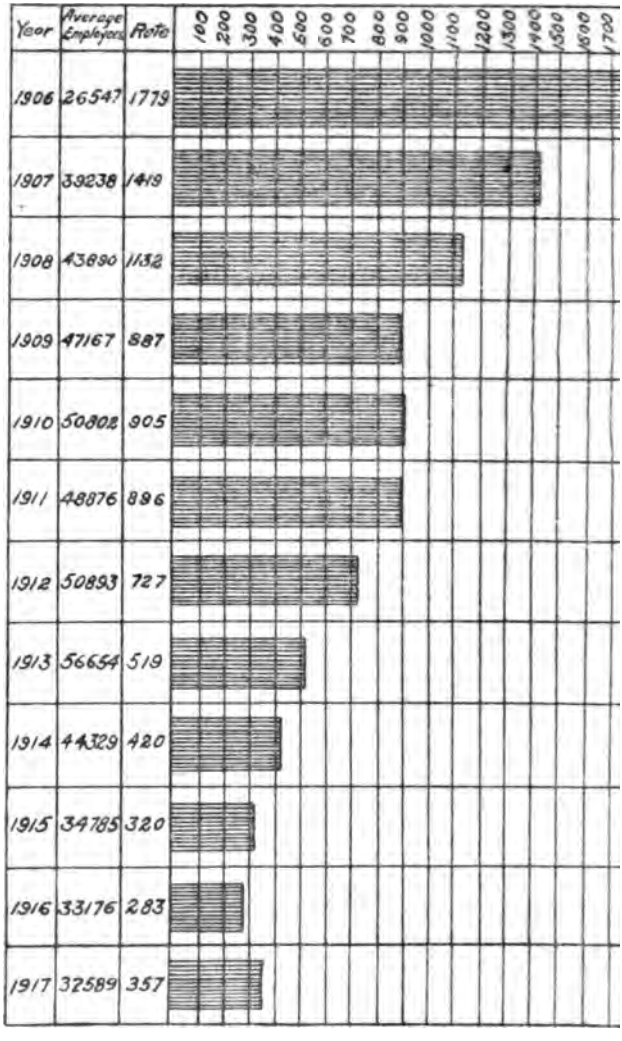

CHART 1.

DEATH RATE PER 1,000 EMPLOYEES.
ALL CAUSES

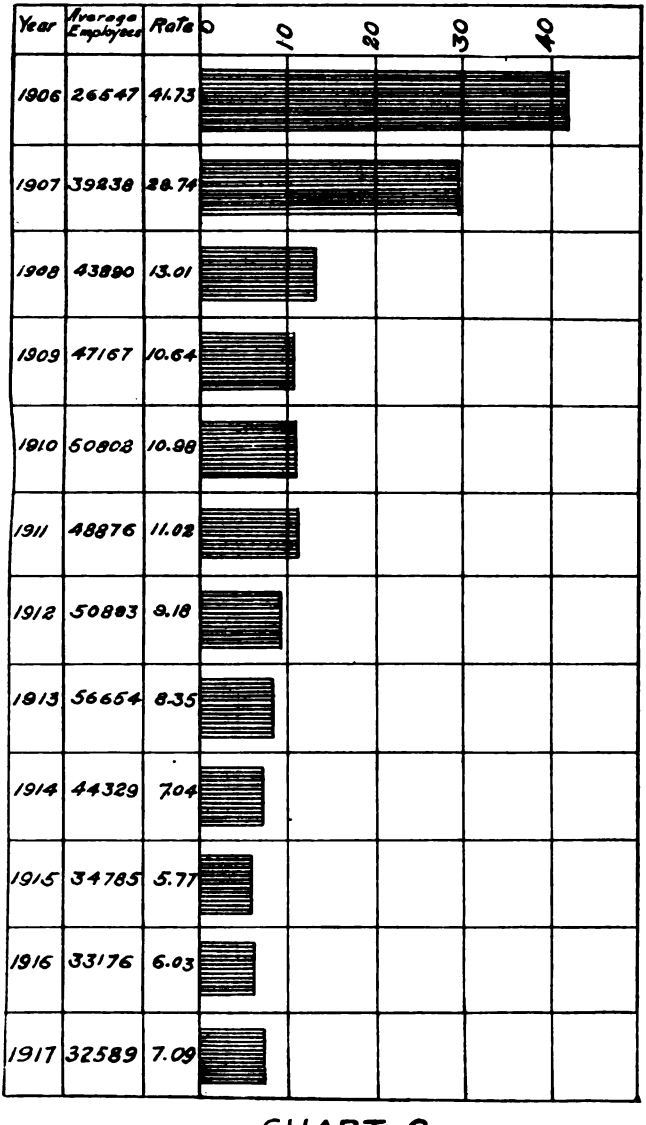

CHART 2.

NONEFFECTIVE RATE PER 1,000 EMPLOYEES.

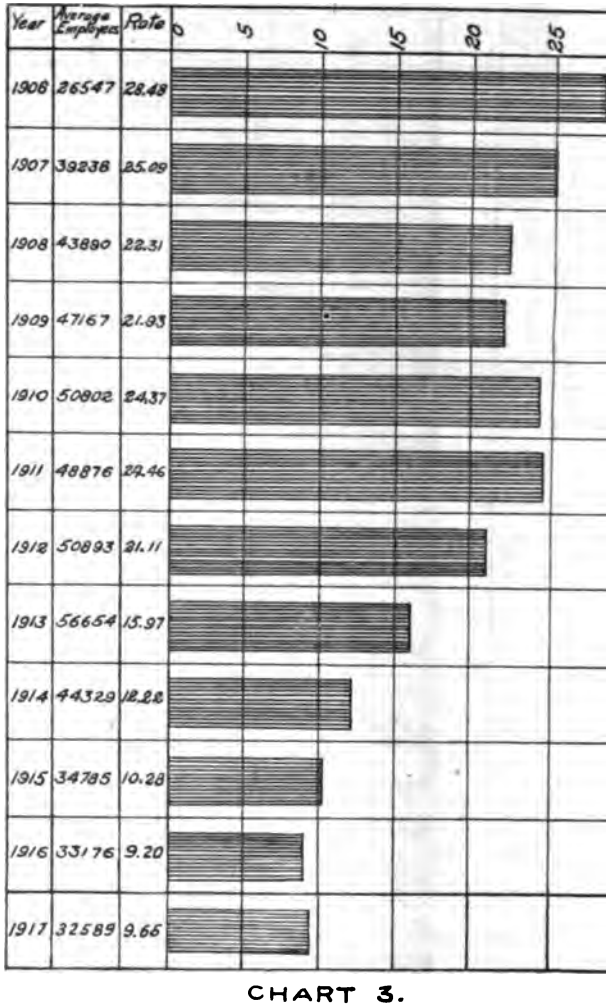

CHART 3.

(Note correction in 1916 rate, 9.20)

MALARIAL FEVER

ISSION RATE PER 1,000 EMPLOYEES

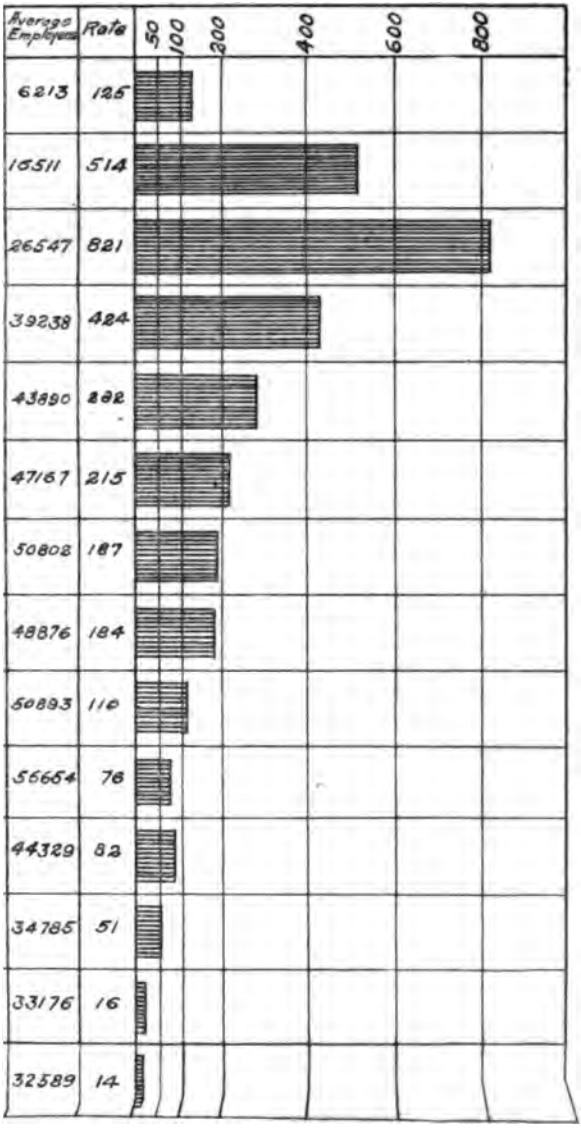

CHART 4.

MALARIAL FEVER
DEATH RATE PER 1,000 EMPLOYEES

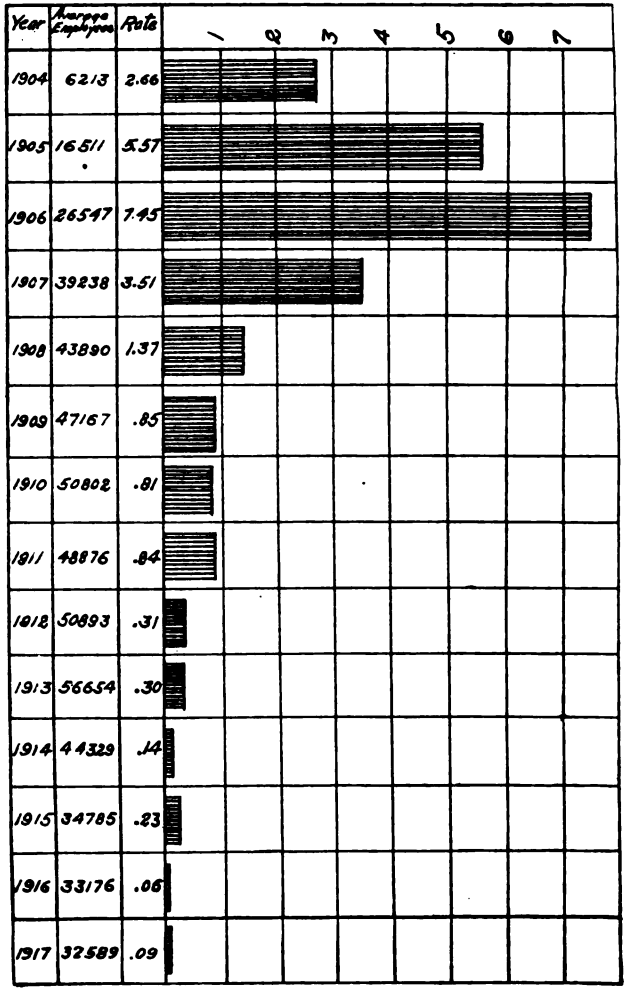

CHART 5.

MALARIAL FEVER
DEATH RATE PER 1,000 POPULATION IN THE
VAL ZONE AND THE CITIES OF PANAMA AND COLON
EMPLOYEES AND NONEMPLOYEES.

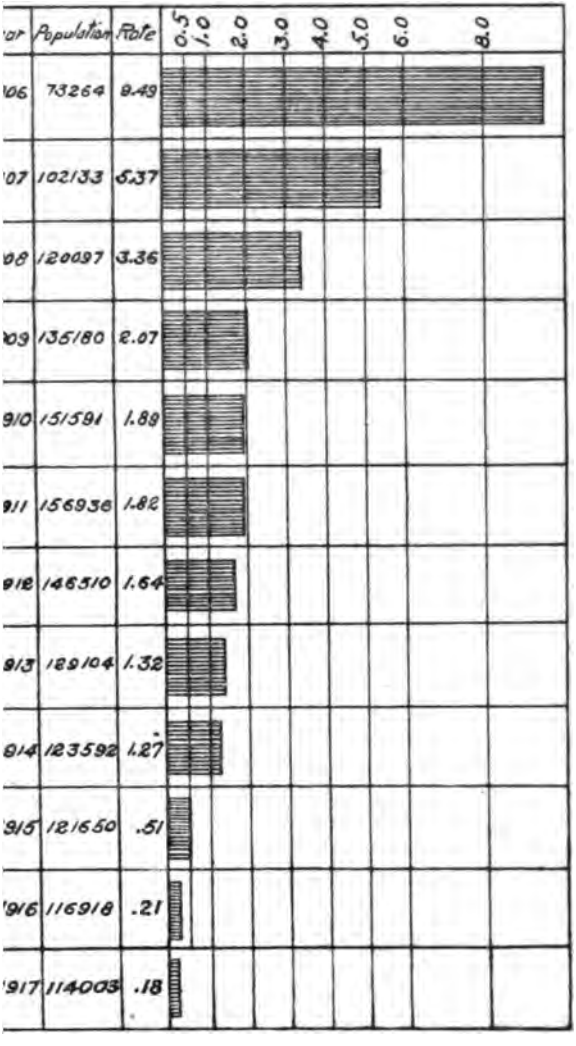

CHART 6.

(Note correction in 1916 rate, 0.21)

TABLE I.—ADMISSIONS, DEATHS, AND NONEFFECTIVE RATES FOR EMPLOYEES.

ABSOLUTE NUMBERS.

	Average number of employees.	Admissions to hospitals.			Deaths.			Noneffective from sickness.	
		Total.	Disease.	External causes.	Total.	Disease.	External causes.	Days treated.	Constantly noneffective.
Year 1917:									
White	4,814	1,551	1,348	203	32	22	10	31,132	85.29
Colored	27,775	3,691	2,719	972	199	165	34	83,648	229.17
Total	32,589	5,242	4,067	1,175	231	187	44	114,780	314.46
Year 1916:									
White	4,552	1,473	1,217	256	24	15	9	29,513	80.86
Colored	28,624	3,186	2,224	962	176	137	39	82,116	224.36
Total	33,176	4,659	3,441	1,218	200	152	48	111,629	305.22

PROPORTIONATE NUMBERS.[1]

Year 1917:									
White	4,814	322.18	280.02	42.17	6.65	4.57	2.08	.....	17.92
Colored	27,775	132.89	97.89	35.00	7.16	5.94	1.22	.....	8.25
Total	32,589	160.85	124.80	36.05	7.09	5.74	1.35	.....	9.65
Year 1916:									
White	4,552	323.59	267.35	56.23	5.27	3.29	1.98	.....	17.76
Colored	28,624	111.31	77.70	33.61	6.15	4.79	1.36	.....	7.84
Total	33,176	140.43	103.72	36.71	6.03	4.58	1.45	.....	9.20

[1] Annual average per 1,000 employees.

TABLE I-A.—DEATHS IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

	Average population.	Deaths.			Annual average per 1,000.		
		Total.	Disease.	External causes.	Total.	Disease.	External causes.
Year 1917:							
Panama	61,074	1,714	1,661	53	28.06	27.19	0.87
Colon	25,386	667	642	25	26.27	25.29	.98
Canal Zone	[1]27,543	[1]313	273	40	11.36	9.91	1.45
Total	114,003	2,694	2,576	118	23.63	22.60	1.03
Year 1916:							
Panama	60,778	1,765	1,702	63	29.04	28.00	1.04
Colon	24,693	696	662	34	28.19	26.81	1.38
Canal Zone	31,447	343	290	53	10.91	9.22	1.69
Total	116,918	2,804	2,654	150	23.98	22.70	1.28

[1] Military forces stationed on Isthmus not taken up in population, and deaths among same not included for last six months of year.

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TABLE II.—CAUSES OF DEATHS OF INFANTS

Cause of death.	Sex.		Color.		Less than 1 week.	1 we and 1 than mon
	M.	F.	W.	B.		
General diseases.						
Malarial fever, estivoautumnal	....	3	1	2	.....	.....
Whooping cough	2	2	....	4	.....	.....
Pyemia	1	....	....	1	.....	.....
Septicemia	1	1	2	....	.....	
Tetanus	....	1	....	1	.....	
Pellagra	1	....	....	1	.....	.....
Beriberi	5	2	....	7	.....	.....
Tuberculosis of the lungs	4	7	....	11	.....	.....
Acute miliary tuberculosis	4	6	....	10	.....	.....
Tuberculous meningitis	7	3	2	8	.....	.....
Abdominal tuberculosis	1	1	....	2	.....	.....
Disseminated tuberculosis	1	3	....	4	.....	.....
Syphilis, hereditary	8	1	1	8	5	
Scurvy	....	1	....	1	.....	.....
Anemia	1	....	....	1	.....	.....
Simple meningitis	2	2	2	2	.....	.....
Cerebro-spinal fever	1	....	....	1	.....	.....
Pneumococcic meningitis	2	1	1	2	.....	.....
Meningeal hemorrhage	2	....	1	1	.....	.....
Epilepsy	....	2	....	2	.....	.....
Convulsions of infants	11	1	2	10	6	
Acute endocarditis	2	1	2	1	.....	
Organic diseases of the heart	1	4	....	5	.....	.....
Diseases of the lymphatic system	3	1	1	3	.....	.....
Acute bronchitis	24	25	4	45	3	
Chronic bronchitis	13	11	1	23	.....	.....
Broncho-pneumonia	70	54	15	109	1	
Pneumonia (unqualified)	8	7	3	12	.....	.....
Lobar pneumonia	5	8	2	11	.....	.....
Pleurisy	1	....	....	1	.....	.....
Empyema	....	1	1	....	.....	.....
Pulmonary congestion	1	....	....	1	.....	.....
Acute stomatitis	....	4	....	4	.....	.....
Acute gastritis	5	4	3	6	1	.....
Acute indigestion	2	3	....	5	.....	.....
Diarrhea and enteritis	150	122	28	244	7	
Colitis	30	37	2	65	1	
Intestinal obstructions	5	2	....	7	.....	
Other diseases of the intestines	....	2	1	1	1	.....
Congestion of liver	2	2	....	4	.....	.....
Peritonitis	1	2	....	3	1	.....
Acute nephritis	8	3	2	9	.....	.....
Chronic nephritis	1	1	....	2	.....	.....
Other diseases of the kidney and annexa	2	1	....	3	.....	.....
Pyelonephrosis	4	....	....	4	.....	.....
Acute cystitis	....	1	....	1	.....	.....
Diseases of the skin and annexa	1	....	....	1	.....	.....
Congenital malformations	6	3	1	8	2	
Atrophy of infants	1	....	....	1	.....	.....
Malnutrition	35	28	1	62	6	
Other causes peculiar to early infancy	27	18	5	40	40	
Lack of care	....	1	....	1	.....	.....
External causes	1	1	....	2	1	.....
Cause of death not specified or ill-defined	5	5	4	6	3	.....
Congenital debility, icterus and sclerema	7	4	3	8	6	
Premature birth	35	35	3	67	57	
Congenital debility	23	13	2	34	22	
Total	533	441	96	878	163	

SEX, COLOR, AGE, AND PLACE OF RESIDENCE.

Age by months.											Place of residence.			Total.
1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	Panama.	Colon.	Canal Zone.	
....	1	....	....	....	....	1	....	1	.....	.....	1	2	.....	3
....	1	....	....	1	....	....	2	.....	.....	.....	3	.....	1	4
....	....	....	....	....	....	....	....	1	.....	.....	.....	.....	1	1
....	1	....	....	....	....	....	....	.....	.....	.....	2	.....	.....	2
....	....	....	....	....	....	....	....	.....	.....	.....	1	.....	.....	1
....	....	....	....	....	....	....	....	.....	1	.....	1	.....	.....	1
....	1	....	1	....	....	1	1	1	1	.....	3	.....	4	7
2	....	1	....	2	....	....	1	2	1	2	10	1	.....	11
....	1	2	1	....	....	1	1	....	3	1	7	1	2	10
....	1	1	....	3	1	....	2	.....	1	1	9	1	.....	10
....	....	....	....	....	....	....	1	.....	.....	1	.....	2	.....	2
....	....	1	....	....	1	1	....	1	.....	.....	2	2	.....	4
1	....	1	....	....	....	....	....	.....	.....	.....	9	.....	.....	9
....	....	....	....	....	....	....	....	.....	.....	.....	1	.....	.....	1
....	....	....	....	....	....	1	....	.....	.....	.....	.....	1	.....	1
....	1	1	1	....	....	....	....	.....	.....	1	3	.....	1	4
....	....	....	....	....	....	....	1	.....	.....	.....	1	.....	.....	1
....	....	....	....	1	....	....	1	1	.....	.....	3	.....	.....	3
1	....	....	....	....	....	....	1	.....	.....	.....	2	.....	.....	2
....	....	....	....	....	....	....	....	.....	1	1	1	.....	1	2
2	....	1	2	....	....	....	....	.....	.....	.....	9	2	1	12
....	1	1	....	....	....	....	....	.....	.....	.....	2	1	.....	3
....	....	....	1	1	2	....	....	1	.....	.....	2	3	.....	5
....	1	2	1	....	....	....	....	.....	.....	.....	4	.....	.....	4
5	7	9	3	3	4	4	6	1	.....	1	34	12	3	49
1	5	2	1	1	2	4	3	3	1	1	1	21	2	24
12	20	19	12	10	11	7	11	6	6	8	70	43	11	124
3	1	....	2	....	2	3	1	2	1	.....	15	.....	.....	15
....	....	2	....	1	2	1	1	2	.....	4	8	4	1	13
....	....	....	....	....	....	....	....	.....	1	.....	.....	1	.....	1
....	1	....	....	....	....	....	....	.....	.....	.....	1	.....	.....	1
....	....	....	....	1	....	....	....	.....	.....	.....	.....	.....	1	1
....	....	1	....	1	....	....	....	.....	.....	1	1	2	1	4
2	....	2	1	....	....	1	2	.....	.....	.....	8	1	.....	9
....	....	....	2	....	1	1	....	.....	.....	1	2	1	2	5
40	39	30	19	17	20	19	17	18	17	16	205	56	11	272
6	8	12	5	8	2	4	6	1	5	4	64	2	1	67
4	....	1	....	....	....	....	....	1	.....	.....	6	.....	1	7
....	....	....	....	1	....	....	....	.....	.....	.....	1	1	.....	2
1	....	....	....	....	....	1	1	.....	.....	1	4	.....	.....	4
....	1	....	....	....	....	....	1	.....	.....	.....	2	1	.....	3
2	1	....	2	1	1	....	....	1	2	1	7	2	2	11
....	....	....	....	1	....	....	....	1	.....	.....	.....	1	1	2
....	....	....	....	....	1	1	....	.....	1	.....	2	1	.....	3
....	....	1	....	1	....	....	1	.....	1	.....	1	1	2	4
....	....	....	....	....	....	....	....	.....	.....	1	.....	1	.....	1
....	....	....	....	....	....	....	....	.....	1	.....	1	.....	.....	1
2	1	....	1	....	....	....	....	1	.....	.....	5	2	2	9
....	....	....	....	....	....	....	1	.....	.....	.....	.....	1	.....	1
4	10	4	8	4	7	2	5	4	4	2	40	9	14	63
2	....	....	....	....	....	....	....	.....	.....	.....	31	9	5	45
....	....	1	....	....	....	....	....	.....	.....	.....	.....	1	.....	1
....	1	....	....	....	....	....	....	.....	.....	.....	1	1	.....	2
....	1	....	....	1	....	1	1	2	.....	1	5	3	2	10
1	2	....	....	....	....	....	....	1	.....	.....	6	1	4	11
1	....	....	....	....	1	....	....	.....	.....	.....	48	18	4	70
6	2	2	1	....	....	....	....	.....	.....	.....	23	10	3	36
98	109	97	64	59	58	54	68	52	48	49	668	222	84	974

TABLE III.—DEATHS AMONG CHILDREN UNDER 1 YEAR OF AGE, BY CAUSE AND

Cause of death.	January.	February.	March.	April.
Malarial fever, estivoautumnal				
Whooping cough	1		1	
Purulent infection and septicemia				
Pyemia				
Septicemia				
Tetanus				
Pellagra	1			
Beriberi	1	1		2
Tuberculosis of the lungs			4	
Acute miliary tuberculosis		2	1	1
Tuberculous meningitis		1	1	2
Abdominal tuberculosis				
Disseminated tuberculosis		1		
Syphilis, hereditary			2	
Scurvy			1	
Anemia, primary, pernicious				
Simple meningitis	1			1
Pneumococcus meningitis	1			2
Cerebral hemorrhage, apoplexy			1	
Epilepsy				
Convulsions of infants (under 5 years of age)			2	
Acute endocarditis			1	
Organic diseases of the heart	1			
Lymphadenitis (nonvenereal)		1	1	
Acute bronchitis	4	6	6	1
Chronic bronchitis	1	1		
Broncho-pneumonia	12	11	11	7
Pneumonia (unqualified)	1		2	3
Lobar pneumonia				3
Pleurisy				
Empyema				
Diseases of the mouth and annexa			2	
Stomatitis			1	
Acute gastritis				
Chronic gastritis				
Acute indigestion				
Diarrhea and enteritis (under 2 years)	20	12	13	17
Colitis	6	1	3	4
Hernia, intestinal obstructions				
Intestinal obstructions	3			
Other diseases of the intestines				
Duodenal ulcer				
Acute yellow atrophy of the liver	1			
Other diseases of the liver	1			
Diseases of the spleen				
Simple peritonitis	2			1
Acute nephritis			2	
Chronic nephritis				2
Other diseases of the kidney and annexa	1			
Pyelonephrosis				
Cystitis				
Other diseases of the skin and annexa				
Congenital malformations (stillbirth not included)			2	
Congenital debility, icterus and sclerema	4			1
Premature birth	6	5	5	4
Congenital debility	2	4	5	6
Atrophy of infants				
Malnutrition	2	5	4	2
Other causes peculiar to early infancy	3	6	1	7
External causes			1	
Cause of death not specified or ill-defined				
Infection of undetermined origin				
Total	75	57	73	66

THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON, ONTH OF DEATH.

May.	June.	July.	August.	September.	October.	November.	December.	Total.
.....	.....	.....	.....	1	2	.....	.....	3
.....	1	.....	1	.....	.....	.....	.....	4
.....	.....	.....	.....	.....	.....	.....	1	1
.....	.....	.....	.....	1	.....	.....	.....	1
.....	.....	.....	.....	1	.....	.....	.....	1
1	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	1
1	2	.....	.....	.....	.....	.....	.....	7
1	.....	.....	.....	2	1	1	2	11
.....	.....	.....	1	1	1	2	1	10
.....	1	1	.....	3	.....	.....	1	10
.....	.....	1	1	.....	.....	.....	.....	2
.....	.....	.....	.....	.....	.....	2	1	4
.....	1	3	.....	1	.....	2	.....	9
.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	1	1
.....	.....	.....	1	1	.....	1	.....	5
.....	.....	.....	.....	.....	.....	.....	.....	3
.....	.....	1	.....	.....	.....	.....	.....	2
.....	1	.....	.....	.....	1	.....	.....	2
2	.....	1	2	1	2	1	1	12
.....	.....	.....	.....	.....	.....	.....	2	3
.....	.....	.....	.....	1	1	1	1	5
1	.....	.....	.....	.....	.....	.....	.....	3
3	1	6	4	2	7	2	7	49
.....	8	1	3	1	5	3	1	24
11	12	13	10	5	13	12	7	124
1	2	3	.....	.....	1	1	1	15
1	1	2	2	.....	4	1	.....	14
.....	.....	.....	.....	.....	.....	.....	1	1
.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	2
.....	.....	1	.....	.....	.....	.....	.....	2
.....	.....	4	.....	1	1	2	1	9
.....	.....	1	.....	.....	.....	.....	.....	1
.....	1	.....	.....	1	2	.....	.....	4
19	31	37	32	25	27	24	15	272
2	13	13	3	1	8	9	4	67
.....	.....	.....	.....	1	.....	.....	.....	1
.....	.....	1	.....	.....	.....	1	.....	5
.....	.....	.....	1	.....	.....	.....	.....	1
.....	.....	.....	.....	1	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	2	.....	.....	1	.....	1	5
.....	.....	.....	.....	.....	.....	.....	1	1
.....	.....	.....	.....	.....	.....	.....	.....	3
1	.....	2	1	1	1	1	2	11
.....	.....	.....	.....	.....	.....	.....	.....	2
.....	.....	1	.....	.....	.....	.....	1	3
1	.....	.....	1	.....	1	.....	.....	3
.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	1	.....	.....	.....	.....	1
1	1	1	.....	.....	3	.....	1	9
1	2	.....	.....	2	1	1	.....	12
6	8	12	9	4	4	2	5	70
3	2	.....	3	.....	2	6	3	36
.....	.....	.....	.....	.....	1	.....	.....	1
3	8	3	7	8	9	5	6	62
3	3	2	1	7	5	4	3	45
.....	.....	.....	1	.....	.....	.....	.....	2
1	.....	3	2	.....	1	3	.....	10
1	.....	.....	.....	.....	.....	.....	.....	1
64	99	115	87	73	107	87	71	974

TABLE IV.—DEATHS BY NATIONALITY.

Nationality.	Employees.		Nonemployees.		Total.		Gr tot
	Male.	Female.	Male.	Female.	Male.	Female.	
Antilles			1		1		
Antigua	3		17	13	20	13	
Austria			1		1		
Barbados	47		207	158	254	158	
Bermuda	1		1	1	2	1	
Bolivia				1		1	
Canada				2		2	
Chile	2		6	1	8	1	
China			38	5	38	5	
Colombia	12		78	61	90	61	
Costa Rica	1		2	4	3	4	
Cuba	2		5	1	7	1	
Curacao			4	1	4	1	
Demerara	1		7	4	8	4	
Dominica	2			3	2	3	
Ecuador			3	2	3	2	
England			4	1	4	1	
Fortune Island	1				1		
France			3	2	3	2	
French Guiana			1		1		
Germany				1		1	
Greece			9	3	9	3	
Grenada	4		28	19	32	19	
Guadeloupe	6		13	4	19	4	
Guiana, British				1		1	
Hayti	1		1	2	2	2	
Holland			2		2		
Honduras			1		1		
India	3		4		7		
Italy			11	3	11	3	
Jamaica	76		318	301	394	301	
Japan				2		2	
Liberia				1		1	
Martinique	12		38	27	50	27	
Mexico	1		4	3	5	3	
Montserrat	1		7	5	8	5	
Nassau	1		1	2	2	2	
Nevis			1	1	1	1	
Nicaragua			1	1	1	1	
Panama	9	1	404	385	413	386	
Peru	1		10	1	11	1	
Philippines			1		1		
Porto Rico			2		2		
Sierra Leone	1				1		
Salvador	1				1		
St. Kitts			1	4	1	4	
St. Lucia	5		19	24	24	24	
St. Thomas			4	7	4	7	
St. Vincent	2		7	5	9	5	
Spain	2		18	9	20	9	
Switzerland			3		3		
Syria			1		1		
Toboga			1		1		
Trinidad	4	1	18	9	22	10	
United States	25	1	37	17	62	18	
Venezuela			12	4	12	4	
Unknown	1		4	3	5	3	
Total	228	3	1,359	1,104	1,587	1,107	

TABLE V.—CAUSES OF DEATHS OF EMPLOYEES, ARRANGED
DENCE ON

Cause of death.	Color.		Age in years.			
	W.	B.	15-20	21-25	26-30	31-35
Diseases.						
Anemia, secondary	1					
Anemia, undetermined		1				
Alcoholism, acute and chronic	1					
Aneurysm	1	7				2
Apoplexy (cerebral hemorrhage)		8		1		
Arterio-sclerosis	1	1				
Brain, abscess of		1			1	
Brain, softening of	1	1				
Carcinoma of the stomach	1	1				
Dysentery	1					
Endocarditis	1	2			1	1
Fever, malarial, estivo-autumnal	1	2		1		2
Gangrene		2				
Gastroenteritis, chronic		1			1	
Heart, organic disease of	1	21			6	3
Hemorrhage, pulmonary	1	1				
Hemorrhage, due to ectopic pregnancy		1				1
Hemorrhage	1					
Hernia, strangulated		1		1		
Hodgkin's disease		1		1		
Intestinal obstruction		1				
Intestines, other diseases		1	1			
Liver, abscess of		3				1
Liver, cirrhosis of		3		1		1
Lungs, abscess of		1				
Lymphosarcomatosis		1				1
Meningitis, pneumococcic		1				
Meningitis, streptococcus	1					
Nephritis, acute	1					
Nephritis, chronic	4	16		1	3	4
Oesophagus, epithelioma of		2				
Pancreatitis, acute gangrenous	1					1
Peritonitis, simple		1		1		
Pericarditis		2			1	
Pneumonia, lobar		29	2	4	7	3
Pleurisy		1				
Pyemia		1			1	
Prostate gland, hypertrophy of		1				
Rheumatism, acute, articular		1				1
Sarcomatosis, general	1					
Septicemia and pyemia	1	2		1	1	
Septicemia, penumococcic		2		1		
Spleen, abscess of		1				1
Syphilis, tertiary		4				2
Toxemia, following thyroidectomy	1			1		
Tuberculosis, disseminated		14		6	4	
Tuberculosis, miliary, acute		2		1	1	
Tuberculosis, pulmonary		20		6	5	5
Urethra, stricture of		2		1	1	
Undetermined		1				

REFERENCE TO COLOR, AGE, AND LENGTH OF RESI-
US.

years—Con.				Length of residence on Isthmus (in years).														
40-50	51-55	56-65	66-80	Under 1.	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-10	10-12	12-15	Over 15.	Life.	Unknown.	Grand total.
				1				1										1
																	1	1
3		2						2				2	2	2				8
2		1		1				3					2		2			8
		1										1		1				2
				1														1
		1											1	1				2
		1								1							1	2
1							1	1				1						1
								1				1						3
												2						3
	1	1											1		1			2
											1							1
3	1	2		1		2	1	2		1		4	5	2	1		3	22
	2												1				1	2
												1						1
			1											1				1
																	1	1
1									1				1					1
																1		1
		1						1				1		1				3
1										1	1				1			3
														1				1
													1					1
												1						1
								1										1
	1													1				1
1		4	2		1			1	1		2	2	9	2	1		1	20
1		1										1			1			2
										1								1
								1										1
1	3	1			1	1	4	3	1 4	2		1	1 5		2	1	5	2 29
	1																1	1
		1													1			1
															1			1
1														1			1	1
					1			1										1
				1										1				2
									1				1					1
							1	1										1
				1														1
	2						2		2	2	1	2		1	3		1	14
							1	1										2
					1		2	1	2	1		2	5	2	1	1	2	20
								1							1			2
												1						1

TABLE V.—CAUSES OF DEATHS OF EMPLOYEES, ARRANGED
DENCE ON

Causes of death.	Color.		Age in years.			
	W.	B.	15-20	21-25	26-30	31-35
External causes.						
Drowning, accidental	3	13	1	1	3	3
Homicide by firearms	....	2	1	....	....	....
Traumatism by railroads	1	3	1	....	....	....
Traumatism by firearms	1	....	....	....	....	....
Traumatism, various	4	11	....	2	3	....
Suicide by firearms	1	1	....	....	1	1
Suicide by railroad traumatism	....	1	....	....	....	....
Other external violence	....	3	....	....	2	....
Total	32	199	6	31	42	33

TH REFERENCE TO COLOR, AGE, AND LENGTH OF RESI-
THMUS—Continued.

ge in years—Con.					Length of residence on Isthmus (in years).														
41–45	46–50	51–55	56–65	66–80	Under 1.	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–10	10–12	12–15	Over 15.	Life.	Unknown.	Grand total.
4	1				1			1				1			1			12	16
1										1					1				2
			1							1		1		1				1	4
															1				1
3	1				1			1	3			1	1	3	1	1		3	15
							1											1	2
																		1	1
		1										1	1			1			3
30	17	12	17	4	7	5	4	14	25	14	9	9	25	39	21	18	3	38	231

BLE VI.—DEATH RATES AMONG AMERICANS ON THE ISTHMUS.

	Annual average per 1,000 population.
hite employees from the United States:	
Disease	4.31
External causes	1.91
Total	6.22
hite women and children from the United States:	
Disease	4.25
External causes	.67
Total	4.92
hite employees and their families from the United States:	
Disease	4.28
External causes	1.27
Total	5.55

TABLE VII.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPL
AND PL

Cause of death.	Sex.		Color.			Age (by years		
	M.	F.	W.	B.	Y.	Less than 1 year.	1-4	5
General diseases.								
Typhoid fever	3	1	1	3	....	....	....	
Malaria	....	2	1	1	....	1	....	
Malarial fever, estivoautumnal	14	5	11	8	....	2	7	
Measles	....	1	....	1	....	....	....	
Whooping cough	2	3	....	5	....	4	....	
Diphtheria and croup	1	....	....	1	....	....	1	
Dysentery	1	1	....	2	....	....	....	
Entamebic	4	....	....	3	1	....	....	
Bacillary	1	....	1	....	....	....	....	
Unclassified	1	....	1	....	....	....	....	
Purulent infection and septicemia	6	2	7	1	....	1	1	
Pyemia	6	....	....	6	....	1	....	
Septicemia	3	2	1	4	....	1	....	
Pyemia and septicemia, pneumococcic	3	....	1	2	....	....	1	
Tetanus	2	4	2	4	....	1	....	
Pellagra	9	19	....	28	....	1	....	
Beriberi	10	3	2	10	1	7	....	
Tuberculosis of the lungs	231	133	27	323	14	11	11	
Acute miliary tuberculosis	17	12	....	29	....	10	10	
Tuberculous meningitis	15	7	7	15	....	10	9	
Abdominal tuberculosis	5	5	....	10	....	2	1	
Pott's disease	1	1	....	2	....	....	....	
Tuberculosis of bones and joints	1	1	....	2	....	....	2	
Tuberculosis of other organs	1	....	....	1	....	....	....	
Tuberculosis of the genito-urinary organs	1	....	....	1	....	....	1	
Disseminated tuberculosis	22	15	3	34	....	4	4	
Syphilis:								
Tertiary	8	2	....	10	....	....	....	
Hereditary	12	1	2	11	....	9	4	
Period not stated	4	1	2	3	....	....	....	
Gonorrheal arthritis	....	1	....	....	....	....	....	
Cancer and other malignant tumors:								
Of the buccal cavity	3	....	1	2	....	....	....	
Of the stomach and liver	6	5	3	8	....	....	....	
Of the peritoneum, intestines, rectum	1	4	....	5	....	....	....	
Of the female genital organs	....	11	5	6	....	....	....	
Of the breast	....	4	....	4	....	....	....	
Of other organs and of organs not specified	4	....	1	3	....	....	....	
Other tumors (tumors of the female genital organs excepted)	....	....	....	1	....	....	....	
Acute articular rheumatism	2	1	....	3	....	....	....	
Scurvy	....	1	....	1	....	....	1	
Diabetes	....	2	2	1	....	....	....	
Hodgkin's disease	....	....	....	1	....	....	....	
Anemia:								
Chlorosis	....	2	....	3	....	....	....	
Primary, pernicious	....	2	....	3	....	1	....	
Secondary, cause not determined	....	....	....	2	....	....	....	
Other general diseases	....	1	....	2	....	....	....	

[1] Deaths among military forces on the Isthmus included for the first six m
only.

EES AND NONEMPLOYEES) AND MILITARY,[1] BY SEX, COLOR, AGE, OF RESIDENCE.

Age (by years).							Age unknown.	Place of residence.			Total.
11–20	21–30	31–40	41–50	51–60	61–75	76–100		Panama.	Colon.	Canal Zone.	
2			2					2		2	4
			1					2			2
	3	4		2				9	6	4	19
	1									1	1
								4		1	5
								1			1
				1	1			2			2
	1	3						3	1		4
	1									1	1
		1							1		1
	1	2	3					5	1	2	8
	4		1					2		4	6
	2	1	1					3	1	1	5
			2					1	1	1	3
1	1	3						3	3		6
1	15	5	4	1	1			17	10	1	28
1	1		4					9		4	13
32	127	101	49	22	6	2		253	92	19	364
	8	1						21	5	3	29
2			1					19	1	2	22
1	1	3	1	1				7	3		10
		1			1			1		1	2
								2			2
		1							1		1
										1	1
1	17	6	4	1				16	11	10	37
	1	3	3	2	1			4	4	2	10
	4		1					11	1	1	13
						1		4		1	5
								1			1
				2	1			2		1	3
		2	2	2	5			4	3	4	11
		1	2		1	1		5			5
	1	2	1	5	2			10		1	11
		2	2					1	1	2	4
	1	1	1		1			1	1	2	4
					1			1			1
1		2						3			3
								1		1	1
	1	1		1				2		1	3
	1										1
	1		1	1				3			3
	1	1						1	1	1	3
		2							1	1	2
	2							1	1	1	2

TABLE VII.—CAUSES OF DEATHS OF CIVIL POPULATION (EMP
AND PI

Cause of death.	Sex.		Color.			Age (by yea	
	M.	F.	W.	B.	Y.	Less than 1 year.	1-4
General diseases—Continued.							
Alcoholism:							
Acute or chronic	1	1	1	1			
Acute	2			2			
Chronic	3	3	2	3	1		
Diseases of the nervous system and of the organs of special sense.							
Encephalitis	1	1	1	1			
Simple meningitis	7	6	7	6		5	5
Cerebro spinal fever		3	1	2			2
Pneumococcus meningitis	4	1	2	3		3	
Locomotor ataxia		1					
Other diseases of the spinal cord		4	1	4			
Cerebral hemorrhage, apoplexy	33	30	7	55	1	2	
Softening of the brain	3	2	1	4			
Paralysis without specified cause	3	5	3	5			
General paralysis of the insane	5	1	1	5			
Other forms of mental alienation	1	1		2			
Epilepsy	3	4				2	1
Convulsions of infants (under 5 years of age)	12	1	2			12	1
Chorea		1					
Other diseases of the nervous system							
Pericarditis	4	2		6			
Acute endocarditis		6	3	14		3	3
Malignant endocarditis	4	3	1	6			
Organic diseases of the heart	97	46	16	122	5	5	
Angina pectoris		2		3			
Diseases of the arteries, atheroma, aneurysm, etc		1		2			
Aneurysm	13		1	14			
Arterio sclerosis	9	4	1	11	1		
Embolism and thrombosis	1	2		3			
Diseases of the lymphatic system (lymphadenitis, etc.)	3	1	1	3		4	
Hemorrhage; other diseases of the circulatory system	2	1	1	2			
Diseases of the respiratory system.							
Diseases of the nasal fossae	1			1			
Laryngitis	1			1		1	
Diseases of the thyroid body		1	1				
Acute bronchitis	36	38	7	66	1	49	22
Chronic bronchitis	23	18	1	40		24	9
Bronchopneumonia	105	89	24	168	2	124	55
Pneumonia (unqualified)	19	17	6	29	1	15	10
Lobar pneumonia	76	36	12	100		13	11
Pleurisy	1			1		1	
Empyema	1	2	2	1		1	
Gangrene of the lungs	4	1		5			
Asthma	1	3		3	1		
Pulmonary emphysema		1		1			
Other diseases of the respiratory system	3			3			
Abscess of lungs	3	2	1	4			

EES AND NONEMPLOYEES) AND MILITARY, BY SEX, COLOR, AGE, OF RESIDENCE—Continued.

Age (by years).								Place of residence.			
11–20	21–30	31–40	41–50	51–60	61–75	76–100	Age unknown.	Panama.	Colon.	Canal Zone.	Total.
	1		1					2			2
		2						2			2
1		2	2			1		3	2	1	6
	1	1						1	1		2
1		1	1					9	2	2	13
1								2		1	3
	1		1					5			5
		1							1		1
1	1		2		1			4	1		5
1	5	22	13	10	6	4		34	23	6	63
		1	1	2	1			3	2		5
	1		2	1	2	2		6		2	8
		2	1	2	1			5		1	6
		2						1		1	2
1	1		1					5	1	1	7
								9	3	1	13
								1			1
	1	1						2			2
	2	2	1	1				3	3		6
2	2	3	1	3				13	4		17
1	2	2	1	1				4		3	7
	19	32	30	24	26	6	1	80	46	17	143
		1	1		1			3			3
				1	1			1		1	2
	1	3	7	4				3	7	5	15
		2		5	3	3		8	2	3	13
		2	1					2		1	3
								4			4
			1	1	1			1		2	3
	1							1			1
								1			1
	1									1	1
		1	1			1		50	20	4	74
1	1	2		2		1		4	35	2	41
2	2		2	3	2			115	64	15	194
1	2	3	1	1	2			33	2	1	36
9	19	21	16	12	7	3		65	29	18	112
									1		1
	1		1					2		1	3
	1	3		1				3	2		5
	1	1			1	1		4			4
			1					1			1
		1	2					2	1		3
1	1	1		2				2	2	1	5

TABLE VII.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPI
AND PL

Cause of death.	Sex.		Color.			Age (by year	
	M.	F.	W.	B.	Y.	Less than 1 year.	1-4
Diseases of the digestive system.							
Diseases of the mouth and annexa	.....	3	.....	3	.....	2	1
Diseases of the teeth and gums	.....	1	.....	1	.....	.....	.....
Stomatitis	.....	2	.....	1	1	2	.....
Other diseases of the stomach (cancer excepted)	1	2	1	2	.....	1	1
Acute gastritis	6	5	3	8	.....	9	2
Chronic gastritis	1	1	.....	2	.....	.....	.....
Acute indigestion	3	3	.....	6	.....	5	.....
Diarrhea and enteritis (under 2 years)	178	147	31	293	1	274	51
Colitis	34	50	3	81	.....	65	19
Diarrhea and enteritis (2 years and over)	3	3	.....	6	.....	.....	2
Colitis	6	4	2	7	1	.....	1
Ankylostomiasis	3	.....	.....	3	.....	.....	.....
Acute appendicitis	2	.....	.....	1	1	.....	.....
Hernia, intestinal obstructions	5	4	.....	9	.....	4	.....
Other hernias	2	.....	.....	2	.....	.....	.....
Intestinal obstruction	2	5	1	6	.....	1	.....
Other diseases of the intestines	.....	2	1	1	.....	1	.....
Constipation	.....	1	.....	1	.....	.....	.....
Duodenal ulcer	1	2	1	2	.....	1	.....
Acute yellow atrophy of the liver	1	1	.....	2	.....	.....	.....
Cirrhosis of the liver	14	8	4	18	.....	.....	.....
Other diseases of the liver	6	4	.....	10	.....	4	1
Abscess of liver (unqualified)	3	1	1	3	.....	.....	.....
Abcess of liver, entamebic	2	1	.....	3	.....	.....	.....
Diseases of the spleen	1	1	.....	2	.....	1	.....
Abcess of spleen	2	.....	.....	2	.....	.....	.....
Simple peritonitis	14	12	5	20	1	2	.....
Other diseases of the digestive system	1	.....	1	.....	.....	.....	.....
Nonvenereal diseases of the genito-urinary system and annexa.							
Acute nephritis	30	19	6	42	1	11	6
Bright's disease (chronic nephritis)	77	52	19	109	1	3	7
Other diseases of the kidney and annexa	10	2	2	10	.....	3	.....
Pyelo-nephrosis	7	1	.....	8	.....	3	2
Cystitis	1	1	.....	2	.....	1	.....
Diseases of the urethra, urinary abscess, etc	2	.....	.....	2	.....	.....	.....
Stricture of the urethra, non-venereal	2	.....	1	1	.....	.....	.....
Hypertrophy of prostate	1	.....	.....	1	.....	.....	.....
Uterine hemorrhage (nonpuerperal)	.....	1	.....	1	.....	.....	.....
Uterine tumor (noncancerous)	.....	1	1	.....	.....	.....	.....
Other diseases of the uterus	.....	3	1	2	.....	.....	.....
Cysts and other tumors of the ovary	.....	1	.....	1	.....	.....	.....

EES AND NONEMPLOYEES) AND MILITARY, BY SEX, COLOR, AGE, OF RESIDENCE—Continued.

Age (by years).							Age unknown.	Place of residence.			Total.
11–20	21–30	31–40	41–50	51–60	61–75	76–100		Panama.	Colon.	Canal Zone.	
.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	3
.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	2
.....	.....	1	.....	.....	.....	.....	.....	2	.....	1	3
.....	.....	.....	.....	.....	.....	.....	.....	10	1	.....	11
2	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	2
.....	.....	.....	.....	.....	.....	.....	.....	3	1	2	6
.....	.....	.....	.....	.....	.....	.....	.....	244	65	16	325
.....	.....	.....	.....	.....	.....	.....	.....	80	3	1	84
.....	1	1	.....	.....	.....	1	.....	2	3	1	6
.....	1	1	2	2	1	1	.....	6	3	1	10
1	1	1	.....	.....	.....	.....	.....	2	.....	1	3
.....	.....	1	1	.....	.....	.....	.....	.....	1	.....	2
.....	1	1	.....	2	.....	1	.....	9	.....	.....	9
.....	2	.....	.....	.....	.....	.....	.....	1	.....	1	2
1	2	.....	1	2	.....	.....	.....	6	.....	1	7
1	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	2
.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	1	.....	.....	.....	1	1	1	3
.....	.....	1	.....	.....	.....	1	.....	2	.....	.....	2
.....	3	5	4	3	6	1	.....	16	4	2	22
1	.....	1	2	1	.....	.....	.....	7	3	.....	10
.....	1	.....	1	2	.....	.....	.....	3	1	.....	4
.....	1	2	.....	.....	.....	.....	.....	2	1	.....	3
.....	1	.....	.....	.....	.....	.....	.....	2	.....	.....	2
.....	.....	2	.....	.....	.....	.....	.....	.....	2	.....	2
4	7	7	4	1	1	.....	.....	14	10	2	26
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	1
.....	13	11	4	2	.....	.....	.....	31	15	3	49
2	20	24	28	26	15	4	.....	61	46	22	129
.....	3	3	1	1	1	.....	.....	8	4	.....	12
.....	.....	1	1	.....	1	.....	.....	5	1	2	8
.....	.....	.....	1	.....	.....	.....	.....	.....	2	.....	2
.....	.....	1	1	.....	.....	.....	.....	2	.....	.....	2
.....	1	.....	.....	1	.....	.....	.....	2	.....	.....	2
.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	1
.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	1
.....	2	1	.....	.....	.....	.....	.....	1	2	.....	3
.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....	1

TABLE VII.—CAUSES OF DEATHS OF CIVIL POPULATION (EMPLOY- AND PLACE

Cause of death.	Sex.		Color.			Age (by years).		
	M.	F.	W.	B.	Y.	Less than 1 year.	1-4	5-10
The puerperal state.								
Accidents of pregnancy	.....	1	.....	.....	1	.....	.....	.....
Extra-uterine pregnancy	.....	1	.....	1	....	.....	.....	.....
Abortion	.....	1	.....	1	....	.....	.....	.....
Puerperal hemorrhage	.....	3	.....	3	....	.....	.....	.....
Puerperal septicemia	.....	6	.....	6	....	.....	.....	.....
Puerperal albuminuria and convulsions	.....	4	1	3	....	.....	.....	.....
Eclampsia	.....	7	1	6	....	.....	.....	.....
Puerperal insanity	.....	1	1	.....	....	.....	.....	.....
Diseases of the skin and of the cellular tissue.								
Gangrene	3	.....	1	2	....	.....	.....	.....
Phlegmom and cellulitis	1	.....	.....	1	....	.....	.....	.....
Elephantiasis	.....	1	.....	1	....	.....	.....	.....
Other diseases of the skin and annexa	1	1	.....	2	....	1	1	.....
Malformations.								
Congenital malformations (stillbirth not included)	6	3	1	8	....	9	.....	.....
Diseases of early infancy.								
Newborn child	.....	1	1	.....	....	1	.....	.....
Congenital debility, icterus, and sclerema	7	4	3	8	....	11	.....	.....
Premature birth	39	37	3	71	2	76	.....	.....
Congenital debility	19	11	3	27	....	30	.....	.....
Atrophy of infants	1	.....	.....	1	....	1	.....	.....
Malnutrition	42	32	1	73	....	65	9	.....
Other causes peculiar to early inancy (including various consequences of labor)	27	17	5	38	1	44	.....	.....
Lack of care	.....	1	.....	1	....	1	.....	.....
Old age.								
Senility	1	4	2	3	....	.....	.....	.....
Affections produced by external causes.								
Suicide by hanging or strangulation	1	.....	.....	.....	1	.....	.....	.....
Suicide by drowning	.....	1	.....	1	....	.....	.....	.....
Suicide by firearms	5	1	1	4	1	.....	.....	.....
Other suicides	1	1	.....	2	....	.....	.....	.....
Other acute poisonings	1	5	2	4	....	.....	.....	.....
Burns (conflagration excepted)	4	1	1	4	....	.....	3	.....
Absorption of deleterious gases (conflagration excepted)	2	.....	.....	2	....	.....	.....	.....
Accidental drowning	25	1	7	19	....	.....	1	.....

S AND NONEMPLOYEES) AND MILITARY, BY SEX, COLOR, AGE RESIDENCE—Continued.

Age (by years).							Age unknown.	Place of residence.			Total.
-20	21-30	31-40	41-50	51-60	61-75	76-100		Panama.	Colon.	Canal Zone.	
....	1	....	....	....	....	....	....	....	1	....	1
....	....	1	....	....	....	....	....	....	1	....	1
....	1	....	....	....	....	....	....	....	....	1	1
....	1	2	....	....	....	....	....	3	....	....	3
1	4	1	....	....	....	....	....	4	....	2	6
1	1	1	1	....	....	....	....	1	2	1	4
1	5	1	....	....	....	....	....	2	3	2	7
1	....	....	....	....	....	....	....	1	....	....	1
....	....	....	....	2	1	....	....	2	....	1	3
....	....	....	1	....	....	....	....	1	....	....	1
....	1	....	....	....	....	....	....	1	....	....	1
....	....	....	....	....	....	....	....	1	....	1	2
....	....	....	....	....	....	....	....	5	2	2	9
....	....	....	....	....	....	....	....	....	....	1	1
....	....	....	....	....	....	....	....	6	1	4	11
....	....	....	....	....	....	....	....	47	25	4	76
....	....	....	....	....	....	....	....	24	3	3	30
....	....	....	....	....	....	....	....	....	1	....	1
....	....	....	....	....	....	....	....	45	12	17	74
....	....	....	....	....	....	....	....	30	8	6	44
....	....	....	....	....	....	....	....	....	1	....	1
....	....	....	....	....	1	4	....	5	....	....	5
....	....	1	....	....	....	....	....	1	....	....	1
1	....	....	....	....	....	....	....	....	....	1	1
1	4	1	....	....	....	....	....	4	1	1	6
....	....	2	....	....	....	....	....	1	....	1	2
....	2	2	2	....	....	....	....	6	....	....	6
....	1	1	....	....	....	....	....	3	....	2	5
....	1	....	....	1	....	....	....	1	1	....	2
1	8	9	5	....	....	....	2	8	2	16	26

TABLE VII.—CAUSES OF DEATHS OF CIVIL POPULATION (EM AND I

Cause of death.	Sex.		Color.			Age (by ye	
	M.	F.	W.	B.	Y.	Less than 1 year.	1-4
Affections produced by external causes—Continued.							
Traumatism by firearms	2	.....	2	.....	.....	.....	.....
Traumatism by cutting or piercing instruments	2	.....	1	1	.....	.....	.....
Traumatism by fall	13	1	2	11	1	1	.....
Traumatism by machines	3	.....	1	2	.....	.....	.....
Traumatism by other crushings (vehicles, etc.)	9	3	4	8	.....	.....	.....
Railroad traumatism	5	.....	1	4	.....	.....	.....
Injuries by animals	1	.....	1	.....	.....	.....	.....
Electricity (lightning excepted)	2	.....	1	1	.....	.....	.....
Homicide by firearms	7	1	2	5	1	.....	.....
Homicide by cutting or piercing instruments	4	.....	2	2	.....	.....	.....
Homicide by other means	2	.....	.....	2	.....	1	.....
Fractures (cause not specified)	4	1	1	4	.....	.....	.....
Other external violence	5	.....	.....	5	.....	.....	.....
Ill-defined diseases.							
Ill-defined organic disease	1	.....	.....	1	.....	.....	.....
Sudden death	1	.....	.....	1	.....	.....	.....
Cause of death not specified or ill-defined	9	13	5	17	....	9	8
Infections of undetermined origin	1	.....	.....	1	.....	1	.....
Total	1,587	1,107	329	2,321	44	974	287
Stillbirths	182	150	40	292	....	.....	.....
Grand total	1,769	1,257	369	2,613	44	974	287

S AND NONEMPLOYEES) AND MILITARY, BY SEX, COLOR, AGE, RESIDENCE—Continued.

Age (by years).							Age unknown.	Place of residence.			Total.
-20	21-30	31-40	41-50	51-60	61-75	76-100		Panama.	Colcn.	Canal Zone.	
											2
....	1	1	.....	.....	.....	.....	.....	.....	.....	2	2
....	1	1	.....	.....	.....	.....	.....	1	.....	1	2
....	4	4	3	2	.....	.....	.....	5	6	3	14
....	1	1	1	.....	.....	.....	.....	.....	2	1	3
1	4	3	2	.....	1	.....	.....	7	2	3	12
1	1	1	.....	2	.....	.....	.....	1	1	3	5
....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	1
....	1	.....	1	.....	.....	.....	.....	.....	2	.....	2
1	1	6	.....	.....	.....	.....	.....	2	4	2	8
....	3	.....	1	.....	.....	.....	.....	2	2	.....	4
....	.....	.....	1	.....	.....	.....	.....	2	.....	.....	2
....	2	2	.....	1	.....	.....	.....	5	.....	.....	5
....	3	.....	1	1	.....	.....	.....	3	2	.....	5
....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	1
....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	1
....	1	2	1	1	.....	.....	.....	15	5	2	22
....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
87	380	377	245	176	105	39	3	1,714	667	313	2,694
....	.....	.....	.....	.....	.....	.....	.....	216	73	43	332
87	380	377	245	176	105	39	3	1,930	740	356	3,026

TABLE VIII.—DEATHS AMONG CIVIL POPULATION (EMPLOYEES AND THE CITIES OF PANAMA AND COLON

Cause of death.	Jan.	Feb.	Mar.	Apr.
General diseases.				
Typhoid fever	.....	.....	1	1
Malaria	.....	.....	.....	.....
Malarial fever, estivo-autumnal	1	.....	2	.....
Measles	.....	.....	.....	.....
Whooping cough	1	.....	1	.....
Diphtheria and croup	.....	.....	.....	.....
Dysentery	.....	1	.....	.....
Dysentery:				
Entamebic	.....	.....	1	.....
Bacillary	.....	.....	.....	.....
Unclassified	.....	.....	.....	.....
Purulent infection and septicemia	1	1	.....	.....
Pyemia	1	.....	1	1
Septicemia	.....	.....	.....	.....
Pyemia and septicemia, pneumococcic	.....	1	.....	.....
Tetanus	.....	.....	.....	.....
Pellagra	2	2	2	2
Beriberi	1	1	1	4
Tuberculosis of the lungs	40	25	32	20
Acute miliary tuberculosis	3	3	1	3
Tuberculous meningitis	1	3	2	2
Abdominal tuberculosis	.....	.....	.....	1
Pott's disease	.....	.....	.....	.....
Tuberculosis of the bones and joints	.....	.....	.....	.....
Tuberculosis of other organs	1	.....	.....	.....
Tuberculosis of the genito-urinary organs	.....	.....	.....	.....
Disseminated tuberculosis	2	2	7	1
Syphilis:				
Tertiary	2	1	.....	.....
Hereditary	1	.....	2	.....
Period not stated	1	.....	.....	1
Gonorrheal arthritis	.....	.....	.....	.....
Cancer and other malignant tumors:				
Of the buccal cavity	.....	.....	.....	.....
Of the stomach and liver	.....	.....	1	1
Of the peritoneum, rectum, etc	.....	.....	1	.....
Of the female genital organs	.....	.....	.....	1
Of the breast	.....	.....	1	.....
Of other organs and of organs not specified	.....	.....	.....	1
Other tumors (tumors of female genital organs excepted)	.....	.....	.....	.....
Acute articular rheumatism	.....	.....	1	1
Scurvy	.....	.....	1	.....
Diabetes	1	.....	.....	1
Hodgkin's disease	.....	.....	.....	1
Anemia:				
Chlorosis	.....	1	.....	.....
Primary, pernicious	.....	.....	.....	.....
Secondary, cause not determined	.....	1	.....	.....
Other general diseases	.....	.....	1	.....
Alcoholism:				
Acute or chronic	.....	.....	.....	.....
Acute	.....	.....	.....	.....
Chronic	1	.....	.....	1

[1] Deaths among the military included for the first six months only.

D NONEMPLOYEES) AND MILITARY,[1] IN THE CANAL ZONE CAUSE AND MONTH OF DEATH.

ay.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1				1				4
				1	1			2
		2	1	5	3	3	2	19
1								1
	2		1					5
				1				1
	1							2
		1		1		1		4
1								1
		1						1
	1	1	2				2	8
1				1	1			6
		1	1	1	1		1	5
			1				1	3
1		2	1	1	1			6
3	2	2	1	3	1	4	4	28
1	2				1	2		13
24	40	31	28	35	26	28	35	364
	1	3	4	3	3	4	1	29
1	1	2		3	3	2	2	22
	1	4	3				1	10
			1		1			2
	2							2
								1
	1							1
6	3	2	3	2	2	3	4	37
2	3			2				10
	1	4	1	1	1	2		13
						2	1	5
		1						1
1	1			1				3
2	2		2		1	2		11
			1	2		1		5
2	2		1		4	1		11
	1		2					4
1			1	1				4
						1		1
				1				3
								1
						1		3
								1
			1	1				3
		1		1			1	3
	1							2
					1			2
			1	1				2
1	1							2
1					1	1	1	6

TABLE VIII.—DEATHS AMONG CIVIL POPULATION (EMPLOYEES AND THE CITIES OF PANAMA AND COLON,

Cause of death.	Jan.	Feb.	Mar.	Apr.
Diseases of the nervous system and of the organs of special sense.				
Encephalitis				
Simple meningitis	2	2		1
Cerebrospinal fever		1		
Pneumococcus meningitis	1			2
Locomotor ataxia				
Other diseases of the spinal cord		1		
Cerebral hemorrhage, apoplexy	4	7	5	2
Softening of the brain		1	1	1
Paralysis without specified cause		1		1
General paralysis of the insane			1	
Other forms of mental alienation				
Epilepsy	1			1
Convulsions of infants (under 5 years of age)			2	1
Chorea				
Other diseases of the nervous system				
Diseases of the circulatory system.				
Pericarditis	2			1
Acute endocarditis		1	1	1
Malignant endocarditis	1		1	
Organic diseases of the heart	6	4	5	7
Angina pectoris	1		1	
Diseases of the arteries, atheroma, aneurysm, etc.	1			
Aneurysm	1		1	
Arteriosclerosis	3	4	1	1
Embolism and thrombosis		1		
Diseases of the lymphatic system (lymphadenitis, etc.)	1	1	1	
Hemorrhage; other diseases of the circulatory system		1	1	
Diseases of the respiratory system.				
Diseases of the nasal fossæ				1
Laryngitis				
Diseases of the thyroid body				
Acute bronchitis	5	7	7	3
Chronic bronchitis	1	2		2
Broncho-pneumonia	29	14	13	15
Pneumonia (unqualified)	3	1	2	4
Lobar pneumonia	9	7	12	10
Pleurisy				
Empyema	1			1
Gangrene of the lungs		1	2	
Asthma	1	1	1	
Pulmonary emphysema				
Other diseases of the respiratory system				
Abscess of lungs	2	2		
Diseases of the digestive system.				
Diseases of the mouth and annexa			2	
Diseases of the teeth and gums				
Stomatitis			1	
Other diseases of the stomach (cancer excepted)	2			
Acute gastritis				
Chronic gastritis			1	
Acute indigestion				1

D NONEMPLOYEES) AND MILITARY, IN THE CANAL ZONE CAUSE AND MONTH OF DEATH—Continued.

May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
			1		1			2
		2	1	1	1	3		13
		1		1				3
		1				1		5
					1			1
		2			1	1		5
5	6	4	7	5	3	7	8	63
		1			1			5
1		1		2	2			8
	2			2	1			6
				1	1			2
	2	1			1		1	7
2		1	2	1	2	1	1	13
					1			1
1							1	2
1					2			6
2	2	2	2	2		1	3	17
1		1	2			1		7
11	10	13	18	13	18	15	23	143
1								3
		1						2
1	2	3	2		1	3	1	15
3						1		13
				2				3
1								4
	1							3
1								1
								1
	1							1
4	4	7	7	7	10	3	10	74
1	9	4	4	4	6	5	3	41
16	17	20	16	6	22	15	11	194
7	4	5	3	1	2	1	3	36
12	6	12	8	6	12	8	6	112
							1	1
					1			3
		1					1	5
			1					4
					1			1
		1				2		3
	1							5
				1				3
	1							1
		1						2
1								3
		6		1	1	2	1	11
		1						2
	1	1		1	2			6

TABLE VIII.—DEATHS AMONG CIVIL POPULATION (EMPLOY
AND THE CITIES OF PANAMA AND CO

Cause of death.	Jan.	Feb.	Mar.	A
Diseases of the digestive system—Continued.				
Diarrhea and enteritis (under two years)	28	16	16	
Colitis	6	2	3	
Diarrhea and enteritis (two years and over)		1		
Colitis		1	2	
Ankylostomiasis	1	1		
Acute appendicitis				
Hernia, intestinal obstruction	3	1	1	
Other hernias				
Intestinal obstructions		1	1	
Other diseases of the intestines				
Constipation				
Duodenal ulcer				
Acute yellow atrophy of the liver	1			
Cirrhosis of the liver	1	4	1	
Other diseases of the liver			2	
Abscess of liver (unqualified)				
Abscess of the liver, entamebic	1			
Diseases of the spleen				
Abscess of spleen				
Simple peritonitis	2	2	1	
Other diseases of the digestive system (cancer and tuberculosis excepted)			1	
Nonvenereal diseases of the genito-uninary system.				
Acute nephritis	2	3	6	
Bright's disease (chronic nephritis)	14	16	5	
Other diseases of the kidney and annexa	1	2	4	
Pyelo-nephrosis			1	
Cystitis				
Diseases of the urethra, urinary abscess				
Stricture of the urethra, nonvenereal				
Hypertrophy of prostate				
Uterine hemorrhage (nonpuerperal)				
Uterine tumor (noncancerous)				
Other diseases of the uterus		2		
Cysts and other tumors of the ovary		1		
The puerperal state.				
Accidents of pregnancy				
Extra-uterine pregnancy				
Abortion				
Puerperal hemorrhage				
Puerperal septicemia	1	1		
Puerperal albuminuria and convulsions				
Eclampsia	1			
Puerperal insanity		1		
Diseases of the skin and of the cellular tissue.				
Gangrene	1			
Phlegmon and cellulitis				
Elephantiasis				
Other diseases of the skin and annexa				
Malformations.				
Congenital malformations (stillbirth not included)			2	

D NONEMPLOYEES) AND MILITARY, IN THE CANAL ZONE CAUSE AND MONTH OF DEATH—Continued.

May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
21	36	53	36	28	28	24	19	325
2	17	16	3	1	11	11	6	84
1	.....	.....	1	1	.....	2	.....	6
1	2	.....	.....	1	1	1	1	10
.....	.....	1	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	1	.....	1	.....	2
1	.....	.....	2	1	.....	.....	.....	9
.....	1	.....	.....	.....	.....	1	.....	2
.....	1	1	.....	.....	.....	2	1	7
.....	.....	.....	1	.....	.....	.....	1	2
1	.....	.....	.....	.....	.....	.....	.....	1
1	.....	.....	1	1	.....	.....	.....	3
.....	.....	.....	.....	.....	.....	.....	1	2
1	1	1	3	2	3	1	4	22
2	1	2	.....	.....	1	.....	2	10
.....	1	.....	.....	1	.....	.....	1	4
.....	.....	.....	1	.....	1	.....	.....	3
1	.....	.....	.....	.....	.....	.....	1	2
.....	.....	.....	.....	2	.....	.....	.....	2
2	.....	6	.....	4	2	3	1	26
.....	.....	.....	.....	.....	.....	.....	.....	M 1
2	1	8	6	1	6	8	4	49
14	9	8	9	11	10	10	12	129
1	1	1	1	.....	.....	.....	1	12
2	.....	.....	2	1	2	.....	.....	8
.....	.....	.....	.....	.....	2	.....	.....	2
1	.....	.....	.....	.....	.....	1	.....	2
.....	.....	.....	1	1	.....	.....	.....	2
.....	.....	.....	.....	.....	1	.....	.....	1
.....	1	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	1	.....	.....	.....	1
.....	.....	.....	.....	1	.....	.....	.....	3
.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	1	.....	.....	.....	.....	.....	1
1	.....	1	.....	.....	.....	.....	.....	3
.....	.....	1	.....	1	.....	2	.....	6
.....	.....	.....	1	1	1	.....	1	4
.....	.....	1	.....	.....	.....	1	2	7
.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	1	.....	.....	1	.....	3
.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	1	1
.....	.....	1	1	.....	.....	.....	.....	2
1	1	1	.....	.....	3	.....	1	9

TABLE VIII.—DEATHS AMONG CIVIL POPULATION (EMPLO
AND THE CITIES OF PANAMA AND CO

Cause of death.	Jan.	Feb.	Mar.	A
Diseases of early infancy.				
Newborn child				
Congenital debility, icterus, and sclerema	4			
Premature birth	6	5	5	
Congenital debility	2	4	5	
Atrophy of infants				
Malnutrition	3	5	6	
Other causes peculiar to early infancy (including various consequences of labor)	3	6		
Lack of care	1	1		
Old age.				
Senility				
Affections produced by external causes.				
Suicide by hanging or strangulation				
Suicide by drowning				
Suicide by firearms	1			
Other suicides				
Other acute poisonings				
Burns (conflagration excepted)		1		
Absorption of deleterious gases (conflagration excepted)			1	
Accidental drowning	2	4	3	
Traumatism by firearms				
Traumatism by cutting or piercing instruments				
Traumatism by fall		3	1	
Traumatism by machines		1		
Traumatism by other crushings (vehicles, landslides, etc.)	2	4	1	
Railroad traumatism	4			
Injuries by animals	1			
Electricity (lightning excepted)				
Homicide by firearms	1	1	3	
Homicide by cutting or piercing instruments		1	1	
Homicide by other means			1	
Fractures (cause not specified)				
Other external, violence				
Ill-defined diseases.				
Sudden death				
Cause of death not specified or ill-defined	1		2	
Ill-defined organic disease	1			
Infections of undetermined origin				
Total	232	193	196	
Stillbirths	27	21	23	
Grand total	259	214	219	

[D NONEMPLOYEES) AND MILITARY, IN THE CANAL ZONE
CAUSE AND MONTH OF DEATH—Continued.

May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1								1
1	2			2	1	1		11
6	8	12	9	4	4	2	5	76
3	2		3		2	6	3	30
					1			1
3	9	4	9	8	11	6	7	74
3	3	2	1	7	5	4	3	44
								2
1			1	1	2			5
	1							1
1								1
1	1			1				6
1							1	2
1			3	1				6
	1			1			1	5
								2
1	2	1		5	1	5	1	26
	1							2
				1	1			2
	1		2	1	2	1	1	14
1					1			3
1	1					1	1	12
		1	1					6
								1
								2
						1	2	8
							1	3
								1
		1	1	1		2		5
1	1				1	1	1	5
							1	1
	2	3	5		2	5		22
								1
1								1
205	246	278	236	220	253	232	218	2,664
16	26	33	37	43	33	25	20	332
221	272	311	273	263	286	257	238	3,026

TABLE IX.—DISCHARGES OF EMPLOYEES FROM HOSPI

Cause of admission.	Jan.		Feb.		Mar.		
	W.	B.	W.	B.	W.	B.	
General diseases.							
Typhoid fever				1		2	
Relapsing fever							
Malarial fever:							
Estivoautumnal	9	12	3	7	7	4	
Tertian	5	5	2	6	3	4	
Quartan							
Undetermined							
Measles							
Diphtheria and croup							
Influenza	9	4	6	5	9	5	
Dysentery:							
Entamebic							
Bacillary						1	
Unclassified							
Leprosy							
Erysipelas			1		1		
Dengue							
Chickenpox		9	1	11		3	
German measles							
Mumps							
Yaws	1						
Purulent infection and septicemia							
Septicemia							
Pyemia and septicemia, pneumococcic							
Tetanus				1			
Pellagra							
Tuberculosis of the lungs		5	2	4	2	3	
Pott's disease							
Tuberculosis of bones and joints							
Tuberculosis of other organs							
Tuberculosis of the lymph glands		3		1	1	1	
Tuberculosis of the genito-urinary organs						1	
Tuberculous abscess							
Disseminated tuberculosis							
Syphilis:							
Primary		1		1			
Secondary	2	9	2	3	2	2	
Tertiary	1	9	1	11	1	11	
Hereditary		1					
Period not stated		1	1		1	1	
Gonococcus infection							
Gonorrhœa	1	9	2	8	4	3	
Gonorrheal arthritis				1			
Gonorrheal bubo							
Gonorrheal orchitis and epididymitis		1				2	
Gonorrheal ophthalmia							
Soft chancre	3	5		6	4	10	
Adenitis chancroidal			2			2	
Cancer and other malignant tumors:							
Of the buccal cavity							
Of the stomach and liver	1		1				
Of the skin							
Of other organs and of organs not specified			1			1	
Other tumors (tumors of female genital organs excepted)	1		1				
Acute articular rheumatism	3						
Chronic rheumatism and gout				1			

ING CAUSE OF ADMISSION AND MONTH OF DISCHARGE.

June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		Grand total.
W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	
....	1	....	....	....	....	....	....	....	....	2	....	2	....	4	4	8
....	....	1	....	....	....	....	....	1	....	....	....	....	....	3	.....	3
6	13	4	24	6	29	7	36	9	47	6	30	6	36	71	248	319
5	3	12	7	3	7	2	7	2	8	2	1	1	3	42	57	99
....	....	....	2	1	1	....	2	....	1	....	3	....	1	1	10	11
1	....	2	1	....	....	....	6	1	2	1	5	1	....	6	14	20
....	....	....	....	1	....	1	2	....	1	1	1	1	3	4	7	11
....	....	....	....	1	1	2	1	....	1	1	1	....	1	4	5	9
17	9	8	2	6	5	8	12	4	7	5	11	5	6	104	82	18
....	....	....	....	....	1	1	....	....	1	1	....	2	1	6	3	9
....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2
....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	3	3
....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	.....	2
....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	1
....	2	1	2	2	2	....	4	....	3	....	2	....	1	4	47	51
....	....	....	....	2	1	....	5	....	....	....	....	....	....	2	6	8
....	1	....	....	1	8	1	2	....	2	1	....	....	....	3	13	16
....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	2
....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	1
....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2
....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
....	....	....	....	....	1	....	2	....	....	....	....	....	....	....	4	4
3	1	....	3	1	....	1	7	....	4	....	6	1	3	11	48	59
....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	2	2
....	....	....	1	....	....	....	....	....	1	....	....	....	....	1	8	9
....	2	....	....	....	1	....	....	....	....	....	....	....	....	....	6	6
....	....	....	....	....	1	....	....	....	2	....	....	....	....	....	4	4
....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3
....	1	1	3	....	2	1	6	....	2	....	....	....	....	9	43	52
1	21	3	28	3	22	....	25	3	27	3	19	2	18	19	212	231
....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	2	2
....	....	....	....	1	....	....	1	....	....	1	2	....	....	5	6	11
....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	2	2
5	7	3	7	....	13	3	11	3	18	2	7	2	14	31	119	150
....	4	1	2	....	1	....	....	....	1	....	1	....	....	1	13	14
....	....	....	....	....	....	....	....	1	1	....	....	....	....	2	2	4
....	1	1	2	1	3	....	1	....	1	....	5	1	1	3	17	20
....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	3	3
....	6	2	6	2	12	2	8	1	10	2	7	....	6	18	92	110
....	1	....	1	....	....	2	3	2	1	2	2	1	3	9	15	24
....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	1
....	1	....	....	....	....	....	....	....	....	....	1	....	1	2	3	5
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	3	4
....	....	2	1	....	....	1	2	....	....	....	....	....	....	7	4	11
....	....	....	....	1	....	....	....	....	....	....	....	....	....	3	1	4
....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2

TABLE IX.—DISCHARGES OF EMPLOYEES FROM HOSPITALS, SHOW

Cause of admission.	Jan.		Feb.		Mar.		Apr.	
	W.	B.	W.	B.	W.	B.	W.	B.
General diseases—Continued.								
Diabetes	1							
Exophthalmic goiter	1							
Anemia secondary, cause not determined					1	1		
Other general diseases		1	2		1	3	1	
Purpura hemorrhagica								
Alcoholism:								
Acute		1		1				
Chronic	2		1		1			
Alcoholic psychosis				1				
Chronic lead poisoning						1		
Other chronic poisonings			1					
Diseases of the nervous system and of the organs of special sense.								
Other diseases of the spinal cord								
Cerebral hemorrhage, apoplexy								
Paralysis without specified cause								1
General paralysis of the insane								
Other forms of mental alienation		1				1		1
Dementia precox								
Epilepsy		1					1	
Hysteria								
Neuralgia								
Neuritis	2	1	3	1		1	2	2
Other diseases of the nervous system					2			1
Neurasthenia								
Diseases of the eyes and their annexa		5	3	10	5	7	2	6
Trachoma								
Diseases of the ears				1				1
Diseases of the circulatory system.								
Pericarditis		1						
Organic diseases of the heart		5		8	1	8	2	10
Angina pectoris								
Diseases of the arteries, atheroma, aneurysm, etc.								
Aneurysm								1
Arterio-sclerosis								
Diseases of the veins (varices, hemorrhoids, etc.)			1					1
Hemorrhoids	4	3	6	1		1	3	
Varices					1			
Varicocele			1		3			1
Phlebitis								
Diseases of the lymphatic system	1		1		1		1	
Lymphadenitis (nonvenereal)	2		2	5	2	7	2	4
Hemorrhage; other diseases of the circulatory system					1			
Diseases of the respiratory system.								
Diseases of the nasal fossæ	4	1	6		1		6	2
Adenoid vegetations								
Diseases of the larynx								1
Diseases of the thyroid body								

E OF ADMISSION AND MONTH OF DISCHARGE—Continued.

ne.	July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		Grand total.
B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	
...	1	...	....	...	....	...	....	1	1	...	....	...	4	2	6
...	....	...	....	...	....	...	....	...	....	...	....	...	1	....	1
2	....	...	....	...	....	...	....	...	....	...	....	...	1	3	4
...	....	...	2	...	3	...	2	...	....	...	....	...	14	6	20
...	....	...	....	...	....	...	....	...	....	...	....	...	1	....	1
...	....	...	1	...	2	1	....	...	....	1	....	...	3	4	7
...	1	...	1	...	....	...	....	...	....	...	....	...	6	....	6
...	....	...	....	...	....	...	....	...	....	...	....	...	....	1	1
...	....	...	....	...	....	...	....	...	....	...	....	...	....	1	1
...	....	...	....	...	....	...	....	...	....	...	....	...	1	....	1
...	....	...	....	...	....	...	....	...	....	1	....	...	....	1	1
1	....	...	....	...	....	...	....	...	....	...	....	1	....	2	2
1	....	...	1	...	....	1	....	...	....	...	....	...	1	3	4
...	....	...	....	1	....	...	....	1	....	...	....	...	....	2	2
1	....	...	....	1	....	...	....	3	....	...	....	...	....	9	9
...	....	...	....	...	....	1	....	...	....	...	1	...	1	1	2
...	....	1	....	2	1	...	....	1	....	...	....	...	2	6	8
...	....	...	....	...	....	...	....	...	....	...	1	...	2	....	2
...	....	...	....	...	1	2	....	...	....	...	....	...	1	2	3
1	4	1	....	1	2	1	1	1	2	3	3	...	27	13	40
...	2	...	1	...	....	1	....	2	....	...	....	...	6	4	10
...	....	...	5	1	1	...	4	1	....	...	....	...	12	4	16
9	2	8	1	4	2	6	....	4	2	4	2	7	24	74	98
...	1	...	....	...	....	...	....	...	....	...	....	...	1	....	1
...	2	2	....	...	....	...	1	...	1	1	1	1	5	7	12
...	....	...	....	...	....	...	....	...	....	...	....	...	....	1	1
2	....	3	1	6	2	8	....	4	....	4	....	3	8	68	76
...	....	...	....	...	....	...	....	...	....	...	2	...	2	....	2
...	....	...	....	...	....	...	....	...	....	1	....	...	....	1	1
...	....	...	....	...	....	...	....	...	....	...	....	...	....	3	3
...	....	...	....	3	....	...	1	...	....	1	....	...	1	4	5
...	....	...	....	...	1	...	....	1	....	...	....	...	3	2	5
...	6	5	4	6	4	3	6	7	3	1	....	3	40	32	72
...	....	...	....	...	....	...	....	...	....	...	....	...	1	....	1
2	3	...	4	...	2	...	2	1	4	1	1	1	23	6	29
...	....	...	....	...	....	...	....	...	....	...	....	...	....	1	1
1	....	...	....	...	2	1	...	2	2	1	3	...	12	5	17
6	2	9	1	5	2	2	2	4	3	5	....	4	18	57	75
...	....	...	....	...	....	...	....	...	1	...	....	1	2	1	3
...	7	...	4	1	7	...	9	1	12	...	2	1	63	7	70
...	....	...	....	1	....	...	....	1	....	...	....	...	....	2	2
...	....	...	....	...	....	...	....	...	....	...	....	...	1	1	2
...	....	...	....	...	....	...	1	...	....	...	....	...	1	....	1

TABLE IX.—DISCHARGES OF EMPLOYEES FROM HOSPITALS, SHOW

Cause of admission.	Jan.		Feb.		Mar.		Apr.	
	W.	B.	W.	B.	W.	B.	W.	B.
Diseases of the respiratory system—Continued.								
Acute bronchitis	5	6	1	2	....	1	3	5
Chronic bronchitis	....	3	1	2	....	....	....	1
Broncho-pneumonia	....	....	....	....	....	....	....	....
Pneumonia (unqualified)	....	1	....	....	....	....	....	....
Lobar pneumonia	....	2	....	2	....	1	....	8
Pleurisy	1	6	....	5	....	1	1	2
Asthma	1	2	....	3	....	4	....	4
Other diseases of the respiratory system	....	....	....	....	....	....	....	....
Abscess of lungs	....	....	1	....	....	....	1	....
Diseases of the digestive system.								
Diseases of the mouth and annexa	....	....	....	1	....	....	....	....
Diseases of the teeth and gums	1	1	....	....	....	1	....	....
Stomatitis	....	....	....	....	....	....	....	....
Diseases of the pharynx	1	....	....	....	....	....	....	1
Pharyngitis	....	....	....	....	1	....	....	....
Follicular tonsillitis	3	2	2	2	1	3	6	1
Ulcer of the stomach	....	1	1	....	1	....	1	....
Other diseases of the stomach (cancer excepted)	....	1	....	....	1	....	....	....
Acute gastritis	....	....	3	2	....	....	....	....
Chronic gastritis	....	....	....	....	....	....	....	....
Acute indigestion	4	1	....	....	....	....	1	....
Diarrhea and enteritis (2 years and over)	....	1	....	2	1	2	....	3
Colitis	....	....	....	....	....	1	....	....
Ankylostomiasis	1	1	1	1	1	1	....	....
Intestinal parasites	....	....	....	....	....	....	....	....
Teniasis	1	....	....	....	....	....	....	....
Appendicitis and typhlitis	1	....	....	....	....	....	....	....
Acute appendicitis	7	1	1	....	1	....	1	1
Chronic appendicitis	1	....	1	....	1	1	2	....
Inguinal hernia	6	8	3	4	6	6	1	4
Other hernias	1	....	1	....	....	1	....	....
Intestinal obstruction	....	....	....	....	....	....	....	....
Other diseases of the intestines	8	3	3	2	6	2	3	3
Constipation	....	1	2	....	1	2	....	2
Duodenal ulcer	1	....	....	....	....	....	....	....
Acute yellow atrophy of the liver	....	....	....	....	....	....	1	....
Cirrhosis of the liver	....	....	....	....	....	....	....	....
Other diseases of the liver	....	....	....	1	1	1	1	1
Abscess of liver (unqualified)	....	....	....	....	....	....	....	....
Cholecystitis	....	....	....	....	....	....	....	....
Simple peritonitis (nonpuerperal)	....	....	....	....	....	....	....	....
Other diseases of the digestive system	....	....	....	....	1	....	....	....
Nonvenereal diseases of the genito-urinary system and annexa.								
Acute nephritis	....	....	....	....	....	....	....	....
Bright's disease (chronic nephritis)	....	2	1	2	....	2	....	5
Chyluria	....	....	....	....	....	....	....	....
Other diseases of the kidney and annexa	1	....	....	1	1	....	....	....
Pyelo-nephrrotis	1	1	....	....	....	....	....	....
Calculi of the urinary passages	....	....	1	....	....	....	1	....
Diseases of the bladder	....	....	....	1	....	....	1	....
Cystitis	1	1	....	1	....	....	....	....

USE OF ADMISSION AND MONTH OF DISCHARGE—Continued.

June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		Grand total.
W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	
4	7	1	3	2	3	1	1	5	3	7	3	7	2	38	49	87
2	2	1	...	...	1	...	...	1	...	1	1	...	...	6	11	17
...	1	...	...	1	...	...	...	...	...	...	...	...	...	1	2	3
1	...	1	...	...	...	...	...	...	...	...	...	...	...	2	1	3
...	2	...	4	...	6	...	6	...	3	...	5	2	3	4	45	49
...	2	...	4	...	5	1	6	...	1	1	1	...	2	9	37	46
1	...	...	2	1	2	1	...	...	1	...	1	...	3	5	26	31
...	...	...	1	1	...	...	...	...	1	...	...	...	...	1	2	3
...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2
...	1	...	...	...	...	...	...	...	...	...	2	...	...	...	4	4
...	2	...	...	...	...	1	1	...	2	...	...	...	2	5	10	15
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	2
...	...	1	...	...	1	...	...	1	1	...	1	...	...	3	4	7
...	...	...	...	...	...	...	1	...	...	1	...	...	...	2	1	3
2	...	1	1	3	5	2	6	3	6	4	5	3	3	33	35	68
1	...	1	...	...	...	...	...	1	1	2	...	...	...	9	2	11
2	...	...	...	...	...	...	...	1	...	...	1	...	...	7	3	10
...	...	...	...	...	...	...	...	...	...	...	1	...	1	5	4	9
1	...	1	...	...	...	...	...	1	...	...	...	...	...	3	...	3
2	...	...	...	1	...	...	...	1	1	...	...	...	...	9	2	11
2	1	...	5	...	6	...	5	1	2	1	...	4	3	10	38	48
3	...	...	1	...	...	...	...	2	3	1	2	...	2	7	10	17
2	1	...	...	...	1	...	2	...	3	...	4	...	2	5	16	21
1	...	...	...	...	...	1	1	...	...	1	...	...	...	3	1	4
1	...	...	...	...	...	...	...	1	...	...	...	1	...	4	...	4
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
4	...	4	...	2	...	1	1	...	1	...	...	1	...	24	4	28
2	...	...	...	1	...	1	...	1	...	...	...	...	1	10	2	12
3	7	2	14	6	8	4	7	3	8	4	9	1	8	41	89	130
1	...	...	...	...	...	...	...	...	1	...	1	...	...	3	3	6
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
5	3	3	8	4	4	3	7	2	7	4	...	4	2	51	42	93
...	1	...	1	...	1	...	...	...	2	...	...	1	...	5	12	17
...	...	1	...	1	...	...	1	1	...	...	...	1	1	6	2	8
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
1	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	2
1	...	...	...	...	1	2	...	...	1	1	...	...	...	7	5	12
...	...	...	...	...	1	...	...	...	...	...	1	1	...	1	2	3
1	...	...	1	...	...	...	...	1	1	...	...	...	...	3	2	5
1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	1	2
1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1	2
...	6	1	2	...	6	1	4	1	2	...	6	2	3	6	41	47
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	2
2	...	1	...	1	...	2	1	...	...	...	...	...	1	8	3	11
...	1	...	...	1	...	...	...	...	1	...	1	...	...	2	5	7
...	...	1	...	...	...	...	...	...	...	1	...	1	...	5	...	5
...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	2	3
...	1	1	...	1	...	3	1	1	1	...	1	2	...	9	9	12

TABLE IX.—DISCHARGES OF EMPLOYEES FROM HOSPITALS, SHOW

Cause of admission.	Jan.		Feb.		Mar.		Apr.	
	W.	B.	W.	B.	W.	B.	W.	B.
Nonvenereal diseases of the genito-urinary system and anneza—Continued.								
Diseases of the urethra, urinary abscess, etc.	1	....	1	....	....	1	....	3
Stricture of the urethra, nonvenereal	....	5	....	1	....	1	....	3
Diseases of the prostate	1	....	....	....	....	....	....	....
Acute prostatitis	....	....	....	....	....	....	....	....
Chronic prostatitis	1	....	....	....	....	....	....	....
Nonvenereal diseases of the male genital organs	1	....	2	2	1	3	....	5
Hydrocele	1	3	....	1	2	1	....	1
Uterine tumor (noncancerous)	....	....	....	....	....	....	....	1
Other diseases of the uterus	1	....	....	....	1	....	1	....
Metritis	....	....	....	....	....	....	....	....
Cysts and other tumors of the ovary	....	....	....	....	....	....	....	....
Salpingitis and other diseases of the female genital organs	....	....	....	....	....	....	....	....
The puerperal state.								
Extra-uterine pregnancy	....	....	....	....	....	....	....	2
Abortion	....	....	....	....	....	....	1	....
Diseases of the skin and of the cellular tissue.								
Furuncle	1	1	....	....	....	....	....	1
Carbuncle	....	....	....	....	....	....	....	....
Acute abscess	2	3	1	4	1	5	....	3
Phlegmon and cellulitis	4	7	3	3	3	6	3	5
Trichopytosis	....	....	....	....	....	....	....	....
Scabies	....	....	....	....	....	....	....	....
Dhobie itch	1	....	1	2	1	....	1	....
Ulcer of the skin	....	2	....	2	1	3	....	3
Tropical ulcer	....	....	....	....	....	....	....	....
Impetigo contagiosa	....	1	1	....	....	....	....	....
Urticaria	1	....	....	....	....	....	....	....
Ingrowing nail	....	....	....	....	....	....	1	....
Other diseases of the skin and annexa	....	1	2	2	4	5	3	2
Diseases of the bones and of the organs of locomotion.								
Diseases of the bones (tuberculosis excepted)	2	1	....	....	....	....	1	....
Caries (nontuberculous)	....	....	....	1	....	....	....	....
Osteomyelitis	....	....	....	....	....	1	....	....
Periostitis	....	....	....	....	....	2	....	....
Diseases of the joints (tuberculosis and rheumatism excepted)	....	....	1	1	1	....	1	....
Ankylosis	....	....	....	1	....	....	....	....
Arthritis	....	1	....	4	8	3	1	7
Synovitis	2	....	....	....	1	1	....	....
Amputations	....	....	....	....	....	....	....	....
Other diseases of the organs of locomotion	1	3	3	....	1	....	4	1
Malformations.								
Congenital malformations	....	....	....	....	1	1	....	3

USE OF ADMISSION AND MONTH OF DISCHARGE—Continued.

June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		Grand total.
W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	
			1		3						1			2	10	12
	2		2		1		3	1	2		2		2	1	25	26
		2												3		3
1														1		1
						1								2		2
	3	1	2		2	1		2			4		2	10	26	36
	3		4		2		4		6		3		2	3	32	35
									1						2	2
		1		1							1		1	6	2	8
1											1			1	1	2
						1			1					1	1	2
	2						1				1		1		5	5
															2	2
														1		1
1	2	2			1	1		2	2		3		1	7	12	19
				1							1			1	1	2
1	2	1	5	2	1	1	2	4	3	5	2	2	3	21	39	60
2	3	5	1	5	8	2	1	1	8		3	2	4	32	50	82
											1				1	1
							1								1	1
	1										2			5	5	10
	2		1		2	3	4		2	1	6	1	5	6	34	40
	1														1	1
													1	3	2	5
														1		1
2			1			2		1						11	1	12
2		2	2	2	8	3	5	4	1		2	3	1	33	32	65
2	4	2		2	1	1	2	3	3	1	2		1	17	16	33
						1								1	1	2
									1		1				3	3
						1			1		1		1	1	5	6
		1						1						5	1	6
				1										1	1	2
			3		1		4	1	2	1	2		1	14	30	44
1					1					1				6	2	8
										1				1		1
1	3		1	2	2			4	2	1	2	2		22	14	36
	2	1			2		1		1		2			2	13	15

TABLE IX.—DISCHARGES OF EMPLOYEES FROM HOSPITALS

Cause of admission.	Jan.		Feb.		Mar.	
	W.	B.	W.	B.	W.	B.
Affections produced by external causes.						
Suicide by poisoning	....	....	....	....	....	....
Poisoning by food	1	4	3	1	1	2
Other acute poisonings	....	....	....	....	....	....
Venomous bites and stings	....	....	....	....	....	....
Snake bites	....	....	....	....	....	....
Conflagration	....	....	1	....	....	....
Burns (conflagration excepted)	2	3	1	3	3	8
Absorption of deleterious gases (conflagration excepted)	....	....	....	....	....	....
Accidental drowning	....	1	....	....	....	....
Traumatism by firearms	....	1	....	....	....	2
Traumatism by cutting or piercing instruments	1	12	....	10	2	11
Traumatism by fall	2	8	....	4	....	5
Traumatism in mines and quarries	....	....	....	....	....	....
Traumatism by machines	1	1	1	5	1	3
Traumatism by other crushings	1	10	1	6	4	5
Railroad traumatism	1	3	....	1	....	1
Dynamite traumatism	....	....	....	....	....	....
Traumatism by landslides	....	....	....	....	....	....
Injuries by animals	....	....	....	....	1	....
Effects of heat	....	....	....	....	....	....
Heat exhaustion	....	1	....	....	....	....
Electricity (lightning excepted)	....	....	....	....	....	....
Homicide by cutting or piercing instruments	....	....	....	....	....	....
Fractures (cause not specified)	4	11	1	6	3	5
Dislocations	....	1	....	2	....	2
Sprains	....	3	....	....	2	2
Other external violence	5	34	9	45	9	35
Ill-defined diseases.						
Ill-defined organic disease	....	....	1	....	....	....
Infections of undetermined origin	2	2	....	3	....	1
No disease	....	....	....	....	....	....
Total	139	212	109	239	131	23

ISE OF ADMISSION AND MONTH OF DISCHARGE—Continued.

June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		Grand total.
V.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	
										1				1		1
3	1		1	1	1	2	1				3	1	1	14	25	39
1		1						1						3		3
							1			1		1	1	2	2	4
															1	1
														1		1
1	4			1	3	2	4				2	1	2	12	37	49
												2		2		2
															1	1
			2		1		2		1	1				1	10	11
	8	1	6	1	8	1	14	1	6	2	11	3	21	16	123	139
	5		5	1	7	4	4	1	12		5	1	7	12	79	91
															1	1
	1		2	1	3		2		2	1	1		2	10	29	39
1	4			1	3		1	1	1		2	3	6	13	53	66
	2		1		3		1		1		1			3	16	19
	1														1	1
					1				1						2	2
1	3		1				1							2	5	7
		1												1		1
															1	1
	1														1	1
													1		1	1
5	4	4	5	1	5	2	4	1	6	1	3			28	56	84
	1						1		2					1	11	12
			2		5		2	1		1			1	4	18	22
6	31	3	34	3	34	4	34	7	50	8	28	3	35	74	438	512
														1		1
2	4		4		4	2	5	3	2	4	7	1		18	39	57
2	2	1				2	2	3	6	2	2	2	2	12	14	26
144	243	122	257	111	309	126	330	127	355	123	293	102	267	1,488	3,325	4,813

TABLE X.—CONSOLIDATED HOSPITAL REPORT.

	Remaining Jan. 1, 1917.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31, 1917.	
	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.	W.	C.
ANCON HOSPITALS.												
Panama Canal employees	42	130	1,037	1,852	16	75	1,036	1,800	3	41	24	66
Panama Railroad employees	10	52	191	1,124	3	53	183	1,020	....	21	15	82
Panama pay cases	0	1	....	5	....	1	....	....	....	5	0	0
Other pay cases	90	56	4,175	1,620	37	156	4,113	1,415	32	25	53	80
Charity cases	12	23	485	391	5	32	452	327	4	30	36	25
Total	154	262	5,888	4,992	61	317	5,784	4,562	39	122	158	253
Corozal Hospital (insane).												
Panama Canal employees	0	6	3	7	....	....	....	8	....	....	3	5
Panama Railroad employees	0	1	....	6	....	....	....	4	....	....	0	3
Panama pay cases	37	188	25	64	3	19	9	28	....	5	50	200
Other pay cases	7	2	35	17	1	6	33	7	2	....	6	6
Charity cases	13	62	4	32	....	1	9	23	....	1	8	69
Total	57	259	67	126	4	26	51	70	2	6	67	283
Corozal farm.												
Panama Canal employees	10	54	9	45	....	....	10	46	....	2	9	51
Chronic ward.												
Charity cases	0	24	.....	39	....	....	.....	8	....	32	....	23
COLON HOSPITAL.												
Panama Canal employees	6	8	196	341	2	13	164	253	31	78	5	5
Panama Railroad employees	1	8	125	359	2	14	106	242	15	102	3	9
Panama pay cases	0	1	27	101	5	12	8	25	14	63	0	2
Other pay cases	12	1	629	159	10	11	507	100	98	44	26	5
Charity cases	1	0	65	34	1	4	57	16	7	12	1	2
Total	20	18	1,042	994	20	54	842	636	165	299	35	23
PALO SECO LEPER ASYLUM.												
Panama pay cases	2	39	.....	3	....	5	1	.....	.....	.....	1	37
Charity cases	1	24	1	7	1	1	.....	1	....	1	1	28
Total	3	63	1	10	1	6	1	1	....	1	2	65
GRAND TOTALS.												
Panama Canal employees	58	198	1,245	2,245	18	88	1,210	2,107	34	121	41	127
Panama Railroad employees	11	61	316	1,489	5	67	289	1,266	15	123	18	94
Panama pay cases	39	229	52	173	8	37	18	53	14	73	51	239
Other pay cases	109	59	4,839	1,796	48	173	4,653	1,522	132	69	115	91
Charity cases	27	133	555	503	7	38	518	375	11	76	46	147
Total	244	680	7,007	6,206	86	403	6,688	5,323	206	462	271	698

XI.—CONSOLIDATED REPORT OF EMPLOYEES TREATED IN QUARTERS.

Stations.	Remaining Jan. 1, 1917.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31, 1917.	
	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.
.....	....	....	1,004	7	....	....	996	7	6	....	2	....
.....	5	....	1,804	125	....	....	1,776	72	30	51	3	2
Miguel.....	....	....	168	13	....	....	153	11	13	2	2	....
.....	1	1	94	131	....	....	86	116	9	16	....	....
.....	....	....	12	13	....	....	11	10	1	3	....	....
.....	1	3	146	59	....	....	139	57	8	5	....	....
.....	2	17	1,104	2,140	....	....	1,105	2,142	....	....	1	15
Total.....	9	21	4,332	2,488	....	....	4,266	2,415	67	77	8	17

ONSOLIDATED REPORT OF DAYS LOST IN QUARTERS BY EMPLOYEES.

Station.	White.	Colored.	Total.
.....	2,027	24	2,051
.....	4,215	404	4,619
Miguel.....	409	60	469
.....	335	331	666
.....	32	27	59
.....	490	206	696
.....	2,624	9,882	12,506
Total.....	10,132	10,934	21,066

TABLE XII.—CONSOLIDATED HOSPITAL AND EMPLOYEES TREATED IN QUARTERS REPORT.

	Remaining Jan. 1, 1917.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31, 1917.	
	W.	B.	W.	B.	W.	B	W.	B.	W.	B.	W.	B.
Hospitals	244	680	7,007	6,206	86	403	6,688	5,323	206	462	271	698
Quarters	9	21	4,332	2,488	....	....	4,266	2,415	67	77	8	17
Total	253	701	11,339	8,694	86	403	10,954	7,738	273	539	279	715

	White.	Colored.	Total.
Total admissions to hospitals, excluding Corozal farm and chronic ward	6,998	6,122	13,120
Total admissions of employees to quarters	4,332	2,488	6,820
Total	11,330	8,610	19,940
Less number of patients transferred from quarters to hospitals, and between hospitals, whose admissions are duplicated in the above figures	327	505	778
Net admissions to hospitals and quarters	11,057	8,105	19,162
EMPLOYEES.			
Total admissions of employees to hospitals	1,352	3,689	5,241
Total admissions of employees to quarters	4,332	2,488	6,820
Total	5,884	6,177	12,061
Less number of employees transferred from quarters to hospitals, and between hospitals, whose admissions are duplicated in the above figures	116	319	435
Net admissions of employees to hospitals and quarters	5,768	5,858	11,626
Annual average per 1,000 admissions of employees	1,198.17	179.75	356.75

CONSOLIDATED DISPENSARY REPORT OF ALL CASES TREATED BUT NOT EXCUSED.

Station.	Employees.			Nonemployees.			Total.		
	White.	Colored.	White.	Colored.	White.	Colored.	White.	Colored.	Total.
Ancon	23,662	56,210	79,872	19,880	42,538	62,418	43,542	98,748	142,290
Balboa	47,993	48,156	96,149	48,484	15,943	64,427	96,477	64,099	160,576
Pedro Miguel	15,351	21,279	36,630	13,025	7,504	20,529	28,376	28,783	57,159
Paraiso	8,888	28,912	37,800	8,146	9,016	17,162	17,034	37,928	54,962
Gamboa	1,052	3,683	4,735	503	3,225	3,728	1,555	6,908	8,463
Gatun	3,303	13,189	16,492	6,405	10,489	16,894	9,708	24,488	34,196
Colon	22,806	70,858	93,664	14,753	22,079	36,832	37,559	92,937	130,496
Total	123,055	242,287	365,342	111,196	110,794	221,990	234,251	353,891	588,142

XIII.—AVERAGE NUMBER OF EMPLOYEES CONSTANTLY SICK IN HOSPITALS AND QUARTERS.

	White.	Colored.	Total.
s:			
n Hospital	49.99	181.45	231.44
ı Hospital	7.54	17.76	25.30
tal	57.53	199.21	256.74
:			
ın	5.55	.07	5.62
oa	11.55	1.10	12.65
o Miguel	1.12	.17	1.29
lso	.92	.91	1.83
boa	.09	.07	.16
n	1.34	.57	1.91
ı	7.19	27.07	34.26
tal	27.76	29.96	57.72
number of employees constantly sick:			
ıitals	57.53	199.21	256.74
ters	27.76	29.96	57.52
tal	85.29	229.17	314.46
number of employees constantly sick per			
itals	11.95	5.77	17.72
ters	7.17	1.08	8.25
tal	7.88	1.77	9.65

XIV.—AVERAGE NUMBER OF DAYS STAY IN HOSPITALS OR QUARTERS FOR EACH ADMISSION OF SICK EMPLOYEE.

	White.	Colored.	Total.
s:			
n Hospital	14.65	21.75	19.74
ı Hospital	8.60	9.23	9.02
:			
n	2.02	3.43	2.04
oa	2.33	3.20	2.39
o Miguel	2.46	4.61	2.62
lso	3.52	2.51	2.93
boa	2.66	2.08	2.36
n	3.33	3.32	3.33
ı	2.37	4.61	3.81
number of days treatment for each em- admitted to either hospitals or quarters	5.27	13.57	9.51

TABLE XV.—PATIENTS OTHER THAN EMPLOYEES TREATED IN HOSPITALS AND REVENUE RECEIVED FROM THEIR TREATMENT.

	Number of admissions.	Number of days treatment	Revenue received.
Paid for by Panama Republic:			
Insane	89	90,858	$68,261.25
Colon Hospital	128	479	1,495.72
Palo Seco Leper Asylum	4	14,023	10,531.75
Residents of Panama, emergency charity patients	35	310	.....
Total	256	105,670	80,288.72
Charity patients (zone)	981	53,325	.....
Outside pay patients	391	6,976	30,941.39
Families of employees	3,746	46,128	61,637.47
Army and Navy patients	2,604	35,242	69,046.93
Public-health service patients	261	5,216	8,549.92
Total	7,983	146,887	170,175.71
Grand total	8,239	252,557	250,464.43

TABLE XVI.—SURGICAL OPERATIONS PERFORMED IN ANCON AND COLON HOSPITALS.

	Ancon Hospital.		Colon Hospital.		Total.	
	Number.	Died.	Number.	Died.	Number.	Died.
Amputations:						
Forearm	1	.....	.....	.....	1	.....
Hand	.....	.....	1	.....	1	.....
Hip joint	1	.....	.....	.....	1	.....
Thigh	1	.....	1	.....	2	.....
Leg	5	1	.....	.....	5	1
Foot	1	.....	1	.....	2	.....
Digits, multiple	11	.....	4	.....	15	.....
Thigh, double	.....	.....	1	.....	1	.....
Operations on bones:						
Craniectomy, decompressive	1	1	2	1	3	2
Craniectomy, exploratory	.....	.....	1	.....	1	.....
Laminectomy	1	1	.....	.....	1	1
Ostiectomy	10	.....	8	.....	18	.....
Resection of shoulder	1	.....	.....	.....	1	.....
Resection of knee	.....	.....	2	.....	2	.....
Wiring of fractures—						
Simple	30	.....	.....	.....	30	.....
Compound	5	.....	.....	.....	5	.....
Bone transplantation	4	.....	2	.....	6	.....
Adenectomy:						
Cervical	13	.....	1	.....	14	.....
Axillary	2	.....	.....	.....	2	.....
Inguinal—						
Single	177	.....	11	.....	188	.....
Double	48	.....	2	.....	50	.....
Femoral	20	.....	.....	.....	20	.....

ABLE XVI.—SURGICAL OPERATIONS PERFORMED IN ANCON AND COLON HOSPITALS—Continued.

	Ancon Hospital.		Colon Hospital.		Total.	
	Number.	Died.	Number.	Died.	Number.	Died.
Herniotomy:						
Inguinal—						
Single	123		36		159	
Double	35		14		49	
Ventral	15		1		16	
Strangulated	1		6	1	7	1
Genito-urinary tract:						
Nephrotomy	6	1			6	1
Nephrectomy	1				1	
Nephropexy	4				4	
Cystotomy	2				2	
Urethrotomy—						
Internal	16		1		17	
External	20	2	1		21	2
Prostatectomy	2	1			2	1
Varicocele, radical cure	23		7		30	
Hydrocele—						
Single, radical cure	31		5		36	
Double, radical cure	9		4		13	
Orchidectomy	10				10	
Epididymotomy	86				86	
Amputation of the scrotum	25				25	
Amputation of the penis	2				2	
Curettage uteri	100		15		115	
Perineoplasty	14		2		16	
Trachelorrhaphy	9		5		14	
Vaginal punctures	1	1	1		2	1
Undescended testicle, double			1		1	
Obstetrical:						
Caesarian section, abdominal	6	2	5	1	11	3
Accouchment force	2				2	
High forceps	4				4	
Low forceps	11				11	
Version	3		2		5	
Perineorrhaphy	6		1		7	
Thorax:						
Thoracotomy	9	1			9	1
Pneumothoracotomy	1	1			1	1
Excision of breast			2		2	
Excision of breast and axilla	1				1	
Rectum:						
Hemorrhoids, radical cure	125		22		147	
Fistula in anus, excision of	19		3		22	
Ischio-rectal abscess with general septicemia			1	1	1	1
General:						
Thyroidectomy	8	1			8	1
Nerve stretching	2				2	
Aneurismorrhaphy			1	1	1	1
Varicose veins, excision of	20		2		22	
Tenorrhaphy	12				12	
Excision of surface neoplasms	37		3		40	

TABLE XVIII.—WARD LABORATORY REPORT—ANCON AND COLON HOSPITAL—Continued.

	Ancon.	Colon.	Total.
Urine examinations—Continued.			
Quantitative estimation of albumen in urine	28	.....	28
Acetone tests	77	.....	77
Sputum examinations	4,171	253	4,424
Tubercle bacilli	344	19	363
Smear examinations	670	87	757
Examinations of spinal fluid	157	3	160
Examinations of vaginal and urethral discharges	531	26	557
Examinations of the eye	21	5	26
Examination of urine sediment	4	.....	4
Throat cultures	14	.....	14
Sputum	11	.....	11
Blood cultures	5	.....	5
Fluid from knee	2	.....	2
Miscellaneous	8	.....	8

TABLE XIX.—SANTO TOMAS HOSPITAL.

	Remaining Jan. 1, 1917.	Admitted.	Died.	Discharged.	Remaining Dec. 31, 1917.
Pay patients	15	1,101	34	1,052	30
Charity patients	416	9,450	990	8,486	390
Total	431	10,551	1,024	9,538	420

Average number of days' treatment per patient admitted	15.21
Average number of patients constantly sick	440.01
Number of days relief furnished patients	160,648

SURGICAL OPERATIONS PERFORMED.

	Number.
Amputations:	
Forearm	1
Hand	2
Leg	4
Foot	1
Digits, multiple	6
Operations of bones:	
Ostiectomy	2
Resection of ankle	1
Wiring of fractures—	
Simple	3
Compound	2
Adenectomy:	
Cervical	13
Axillary	3
Inguinal—	
Single	111
Double	24
Herniotomy:	
Inguinal—	
Single	95
Double	10
Femoral	2
Ventral	13
Strangulated	8
Genito-urinary tract:	
Perinephritic abscess, drainage of	1
Cystotomy	3
Urethrotomy—	
Internal	38
External	46
Hydrocele—	
Single, radical cure	23
Double, radical cure	7
Orchidectomy	7
Epididymotomy	1
Amputation of the penis	2
Curettage uteri	104
Perineoplasty	3
Trachelorrhaphy	5
Vaginal sections	25
Circumcision	196
Obstetrical:	
Caesarian section, abdominal	1
Perineorrhaphy	1
Thorax:	
Excision of breast	2
Rectum:	
Hemorrhoids, radical cure	53
Fistula in anus, excision of	17
Prolapsus rectum, radical excision	1

	Number.
General:	
Excision of tongue	1
Thyroidectomy	1
Varicose veins, excision of	3
Excision of surface neoplasms	8
Gunshot wound of soft parts, operation for	2
Stab wound of soft parts, operation for	2
Plastic operation for severe injuries	1
Skin graft	110
Laparotomy:	
For intestinal obstruction	2
Exploratory	1
Gastrotomy	1
Entero-enterostomy	1
Appendectomy	98
Appendectomy with local peritonitis	2
Appendectomy with general peritonitis	3
Colostomy	3
Resection of rectum	1
Cholecystotomy	2
Cholecystectomy	2
Abscess of liver—	
Lapro-hepatotomy for	4
Thoraco-hepatotomy for	6
Splenectomy	3
Pan-hysterectomy	19
Supravaginal hysterectomy	17
Hysteromyomectomy	5
Salpingectomy—	
Single	23
Double	22
Salpingo-oophorectomy	46
Ovarian cystectomy	2
Oophorectomy	8
Suspensio-uteri	65
For ectopic gestation	1
Eye, ear, nose, and throat:	
Adenoidectomy	18
Tonsillectomy	128
Mastoidectomy	4
Enucleation eye	4
Pterygium	14
Cataract	6
Incision of eye	3
Iridectomy	9
Cyst of eyelid	2
Major operations, various other	100
Minor operations, various	798
Total	2,418

TABLE XX.—BOARD OF HEALTH LABORATORY.

Bacteriological examinations:	
Fluids and exudates	91
Blood cultures	253
Throat cultures (diphtheria suspects)	1,543
Cultures from autopsies	19
Stools	502
Urines	316

TABLE XXII.—REPORT OF ROUTINE SANITARY WORK PERFORMED IN THE CANAL ZONE AND PANAMA AND COLON.

	Panama.	Colon.	Canal Zone.
Miles of new ditches dug	13.0	32.2	.....
Acres of pools oiled	558.6	516.7	.....
Acres of vegetation removed	490.7	945.3	.....
Mosquito breeding places destroyed	2,553	1,092	.....
Buildings inspected	53,044	120,319	40,326
Houses disinfected or fumigated	201	.....	170
Number of private properties cleaned	108	40,228	.....
Nuisances abated	3,440	6,407	29
Number of cans of garbage emptied daily	1,440	2,717	2,451
Number of rats killed	11,643	6,011	6,089
Mosquitoes caught:			
Culex and mansonia	.....	15,683	598,204
Anopheles	.....	30,326	16,089
Stegomyia	.....	.....	1,088
Materials used:			
Crude oil, gallons	44,550	34,736	101,686
Larvacide, gallons	3,683	2,587	2,440
Kerosene, gallons	3,646	.....	5,720

TABLE XXIII.—PERSONNEL REPORT.

[Average number of employees at work during the year.]

	1917	1916	Dec. 31, 1917.		
			Gold.	Silver.	Total.
Chief health officer	3	4	3	.....	3
Medical storehouse	8	8	5	4	9
Quarantine service	48	45	13	35	48
Health office:					
Panama	147	159	14	143	157
Colon	160	172	13	142	155
Ancon Hospital	330	362	117	211	328
Colon Hospital	44	41	19	26	45
Santo Tomas Hospital	6	6	6	.....	6
Palo Seco Leper Asylum	27	29	29	29	31
Zone sanitation	134	124	4	158	162
Corozal Hospital and farm	123	59	18	100	118
Dispensaries:					
Balboa	9	7	6	4	10
Gamboa	1	1	1	.....	1
Gatun	4	4	2	2	4
Paraiso	4	4	2	2	4
Pedro Miguel	4	3	2	2	4
Total	1,052	1,028	227	858	1,085

1918.

REPORT

OF THE

HEALTH DEPARTMENT

OF

THE PANAMA CANAL

FOR THE

CALENDAR YEAR

1918

ARTHUR T. McCORMACK

Lieutenant-Colonel, Medical Reserve Corps, United States Army
Chief Health Officer

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LETTER OF TRANSMITTAL

THE PANAMA CANAL,
HEALTH DEPARTMENT,
BALBOA HEIGHTS, C. Z., *January 15, 1919.*

Col. CHESTER HARDING,
Governor, The Panama Canal,
Balboa Heights, Canal Zone.

SIR: I have the honor to submit the following report of the operations of the health department for the year 1918.

Respectfully,
ARTHUR T. MCCORMACK,
Chief Health Officer.

GENERAL REMARKS.

MALARIA.

Malaria continues to be the principal preventable disease against which our sanitary work is directed. During the past years it has been demonstrated, as might have been reasonably expected, that the slightest relaxation in the rigid antimosquito work will be followed by an immediate response in at first a gradual and then a rapid increase in the incidence of malaria.

The number of malaria cases among employees for the past three years, has been as follows:

	1916	1917	1918
From the sanitated areas of the Canal Zone and the two cities	505	264	182
From jungle-clearing camps	42	173	260
From fortification work and excursions into the jungle, interior points, etc		36	30
Total number of cases	547	473	472

Included in the 1918 total are 32 carriers found in a jungle clearing camp which were sent into the hospital for special study and not because they were sick.

The average number of employees for the year was approximately 25,520. This gives a total malaria rate of 18.5.

However, there were 2,000 employees working in the jungle who furnished 260 cases, of which 32 were the carriers mentioned. In the 23,520 employees in the sanitated area and the two cities, this gives a rate of 7.7, while in the adjacent jungle camps the rate was 130 per thousand.

The difference between the rate in the sanitated area, 7.7 and the unsanitated areas, 130, is really the sanitary index of the Isthmus. Without constant antimosquito work by a trained and well-supervised body of sanitary inspectors the former rate would quite rapidly approach the latter.

The encroachment of the cattle industry on the areas nearer military reservations and civil settlements has shown that profuse anopheles breeding results in all wet areas where cattle tracks are found and this increases danger of flights to quarters at night. It will be necessary to direct that no cattle be allowed in wet areas, nor during the wet season at all, within a mile and a half from inhabited areas.

The health department has strongly recommended and the Governor, the General commanding the Department, and the Admiral of the 15th Naval District have urged upon their respective departments the necessity for a sanitary fill along the east side of the Margarita road from Emiliano Hill to Coco Solo, near Colon. This is a continuous swamp, and is the source of all of the mosquitoes at France Field, Coco Solo Navy Base, and Fort Randolph. It is of the utmost importance that this fill be made without delay.

The sanitary fill along the Ancon-Corozal road has been considered completed. On account of settling, additional fills should be made where necessary.

Excepting Coco Solo, Pueblo Nuevo and Las Sabanas, suburbs of Panama, have been the most prolific source of malaria, not only in Panama but among our employees and other Americans who drive through them. A careful topographical sanitary survey has been ordered with a view to sanitating this extensive mosquito-breeding area in the same comprehensive way as the sanitated areas of the Zone.

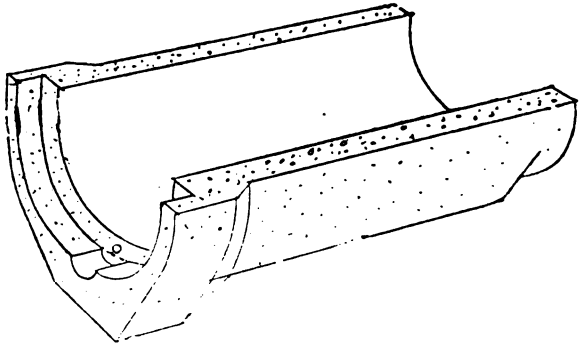

FIGURE 1.

A valuable contribution to antimalarial work was made by one of our sanitary inspectors, in devising a sectional concrete ditch bottom. Figure 1 shows a section of this drain 30" long by 10"

inside diameter. Each section has a bell joint which is provided with a male and female union. The joints are held together by a ½-inch steel plug, which stiffens the segments until they have been properly backfilled and leveled and the cement poured in the joints has hardened. The proportion of cement, sand, and gravel is the same as in ordinary block construction. They are reinforced with chicken wire. Each segment weighs 100 pounds. Portability and reclamation of the segments of an abandoned drain are special advantages in addition to economy in permanent drain construction and the far better character of ditch made by these segments compared with "green" concrete construction in flowing water. The size of the segment can be varied. Key walls can be added in "green" concrete and curved and angle sections are easily constructed.

INFLUENZA.

Influenza arrived on the Isthmus in a transport of soldiers from Porto Rico in September. This was the first and mildest type of influenza, which had been imported from the first Spanish outbreak directly to Porto Rico. There were 1,530 cases in the Zone, most of which were in the Porto Rican soldiers and were quite mild, but followed by complete prostration and frequently by nervous sequela. There were no deaths during this time. This was due to the immediate hospitalization of cases and the care of isolation and treatment carried out. Nine ships having had deaths from pneumonia following influenza or having an epidemic of the disease aboard later, were quarantined at Colon. The deaths from these ships and from the patients removed from them were quite numerous, but the disease did not again appear in epidemic form on the Isthmus.

PNEUMONIA.

Pneumonia continues to give a high death rate and this will continue until the quarters of the silver employees are modernized and made adequate. A survey showed that, with practically the same population, the out-of-date and unsanitary silver quarters at Paraiso had nine times as much sickness and loss of time from work as came from the modern village of Red Tank.

MENINGITIS.

The occurrence of cerebrospinal meningitis on the Japanese steamer *Anyo Maru*, en route from Yokohama to Callao, Peru, presented a novel and interesting problem in epidemiology. Between Yokohama and San Francisco there were several cases of this disease. Not being a maritime quarantinable disease it was not detained and after leaving Balboa, a port of call, there was recrudescence and the Peruvian authorities refused to receive the vessel. At the request of its owner, permission was cabled to return to Balboa, and, upon arrival on May 28, 1918, 585 passengers and 16 of the crew were disembarked. There had been 16 deaths on the ship, the last occurring

just after arrival at Balboa. Four acute cases were evacuated from the ship and three others developed within a few days. Large spinal and intravenous injections of Flexner's serum, frequently repeated, promptly relieved these cases, all of which recovered without paralysis or other sequela. Careful examination and reexamination showed that the remainder of the crew were not carriers, and, after carefully spraying all parts of the vessel with larvacide, so it would have to be cleaned out by steam and scrubbed by hand, the ship was allowed to continue to its destination. Five thousand six hundred and eighty-two plate cultures were made from throat swabs from 602 individuals and 103 carriers were detected. These were isolated, irrigated frequently with Dakin's solution and sprayed with Dichloramin-T and all but three gradually cleared up; these three were finally transshipped as carriers. Very large and frequently repeated intravenous injections of Flexner's serum after clinical diagnosis, even before spinal cultures are positive, are of curative value in the meningo-cæmic and rapidly fatal type of the disease which confronted us. Most of the cases that had died had been ill less than 30 hours

VENEREAL DISEASES.

Since the American occupation our statistics show a fairly constant admission rate to hospitals and quarters of 12½ per cent from venereal diseases. Since 1904 there have been 27,633 cases of venereal disease actually treated in the Canal Zone by American physicians.

This problem has given us our greatest concern. The fact that the cities of Panama and Colon are in the exclusive sanitary jurisdiction of the United States and the police jurisdiction of Panama seriously complicates the matter. The alarming increase of these diseases among our soldiers forced the general commanding the department to issue General Order 26, which in effect was a quarantine against the terminal cities on account of venereal diseases, the widespread illicit sale of habit-forming drugs and alcohol abuse. (See remarks under Colon Hospital, Health Office, Panama, and Health Office, Colon.)

SMALLPOX.

Just as the schools were opening, this disease was introduced from some of the interior villages into the city of Panama. It had been 4 years since there had been a systematic vaccination of the population of the terminal cities. The entire population of the two cities has now been vaccinated and while cases are occasionally brought into the country, it has at no time approached epidemic form. A total of 133 cases were admitted from July 10, 1918, to December 31, 1918.

TUBERCULOSIS.

In the cities of Panama and Colon tuberculosis has increased due to over-crowding. Men, women, and children have been crowded into small 10′ by 10′ rooms—frequently as many as 10 or even 12 in such a room. All that was necessary to spread tuberculosis under the circumstances was to have an initial case. The health

officers of Panama and Colon initiated surveys in which they located hundreds of these small rooms in rented houses, many of them without windows or other means of ventilation. Rigorous enforcement of regulations requiring standard windows with fixed lattice ventilation at first brought vigorous protest from property owners, which, as the work progressed, and its benefits became evident, disappeared.

The Panama Red Cross, with the active support of the former Chief Health Officers, had added an anti-tuberculosis campaign to the already excellent child-welfare work they had been doing. The active support of the President of Panama and the constant and politic interest and supervision of the honorary President of the Panama Red Cross, brought to this work the sympathetic assistance of everyone in Panama interested in its welfare. At the suggestion of the Medical Director of the anti-tuberculosis campaign, the following program of work was approved, his original suggestion being amended so as to bring it in line with the best approved work in the States.

PLAN OF ANTITUBERCULOSIS CAMPAIGN OF THE PANAMA RED CROSS.

"Tuberculosis is the most frequent cause of death in adults in Panama. It is caused by a germ or seed called the tubercle bacillus. These germs are found in the fluid coughed up by victims of the disease, and, when so coughed up, they are spread from the sick one to others. Infants and small children, and adults weakened by other chronic diseases or by vice, are especially liable to the development of these disease germs when exposed to persons having the disease.

"Those having tuberculosis are too sick to work efficiently, and are therefore charges upon their families or upon the public treasury.

"The object of a national antituberculosis campaign is:

1. To effectively treat existing advanced cases so as to arrest the progress of the disease in as many of them as possible.

2. To systematically examine the well or those showing even the slightest indisposition, so as to detect tuberculosis in its incipient stages when it may be entirely relieved.

3. To prevent the dissemination of the germs or seed of the disease from those sick of it, to the well.

4. To relieve existing cases of ill-health and remove existing causes of ill health so as to build up average individual resistance to disease.

"The isolation of advanced cases in adequate hospitals is the best way to avoid the spread of the disease, and thereby these patients can at least be made far more comfortable and frequently may find their condition improved or even be cured. Those who improve sufficiently will then learn how to avoid being a constant menace in their own homes, and will be taught to lead a useful life, quite confident that with continued good nourishment and hygienic living in the open air they may live among their own people without danger to them.

"It is important to recognize that such a hospital is in reality more a school or university where the pupils are taught to get as well as possible and at the same time to so care for themselves that they will

neither infect their family or friends nor constantly reinfect themselves as the untaught are constantly doing. If the purpose of such a hospital were to isolate all cases of phthisis, we would need accommodation for more than 2,000 cases, with an initial cost of $800,000, and a maintenance cost of $562,500, which are both quite beyond our means and also would be unnecessary extravagance if we had the means.

"The spread of the disease can be prevented by:

1. Finding out where the patients live, keeping them under supervision, and teaching them how, and then obliging them to observe certain precautions which will minimize the danger of contagion.

2. Teaching those who live in the same house with a patient the way to prevent contagion, so that the necessary precautions will be taken.

3. Exacting vigilance so that the precautions and treatment be carried out with strict punctuality and that they lead a life likely to increase their power of resistance. This work, properly organized, should be executed by dispensaries located in different parts of the cities and in the provinces.

"The power of resistance or immunity can be defined in five essential parts:

1. Removal of any other existing cause of ill-health, as malaria or intestinal infections.

2. Good nourishment.

3. Good housing with adequate fresh air and without overcrowding.

4. Abstinence from all vices.

5. Avoiding fatigue by adopting work which will not over-tax the strength of the patient.

"The first part of this program would involve systematic examination of the blood of all the sick for malaria and of their bowel discharges for intestinal infections, either parasitic or bacillary, and the prompt and effective relief of either, when found. The second part would be to teach that good nourishment is then the thing to consider, that luxuries are unnecessary, and amusements should take a secondary place. The third part would be to implant the necessary measures for proper light and ventilation of all dwellings. The fourth part would deal with the establishment of proper laws against intoxication; the prohibition of opening drinking saloons on holidays; the suppression of canteens kept by women; lectures against alcoholism, even in the schoolroom, eventually abolishing the manufacture of alcohol; and applying vigorously the law against selling cocaine, morphine, opium, and other habit-forming drugs. For the fifth part it is only necessary that the labor laws be put in practice and that work for those susceptible to tuberculosis be wisely chosen for them.

"This phase of the campaign comprises a large and complex work. In the first instance comes the necessity to destroy the sputum which is the principal cause of contagion, and experience in the Red Cross Dispensary has shown the keen desire on the part of the patients and of their relatives to adopt the precautions indicated by the doctors. I am convinced that this must be the prime object of the campaign because the sputum, in my opinion, in Panama, is the only source of contagion, and because precautions against sputum and particles ejected by patients when they cough are easily understood by the

general public, and do not clash with established customs, which is often the cause of the failure of many attempted social reforms. This does not imply that other precautions will be overlooked, since, although of secondary importance, they exercise much influence in the resisting power of the patients, and they will correct the errors, prejudices, and ignorance of the past. The old habits and ideas are so deeply rooted that they can not be destroyed in a day. A methodical and patient teaching should be adopted avoiding any violent action which would cause displeasure and rebellion as has sometimes happened when governmental or scientific impositions have hurt personal interests by want of knowledge of existing conditions at the time when new rules are established.

"The campaign, accordingly, should be established on the following lines:

Creating, first of all, the Directorate General of the Antituberculosis Campaign, composed of one of the Secretaries of State (Hacienda or Fomento) with the two Presidents of the Executive Committee of the Panama Red Cross, the Treasurer and the Secretary of the same committee and the Director of the Tuberculosis Clinic of the Panama Red Cross. This would create a Directorate composed of one representative of the Government, three prominent members of our social world, and two doctors, one of whom is the Chief Health Officer of The Panama Canal. They would develop:

1. The necessary dispensaries. Two in the city of Panama besides the one already established in the Red Cross building. Two for the city of Colon. One for the principal town of each province in the Republic.

2. Two sanatoriums with accommodation for 500 patients or more, one within the limits of the city of Panama, and the other in a place where conditions of altitude, climate, and means of communication would be found the best in the Republic.

"The dispensaries would have the following personnel: In Panama for each dispensary, a doctor, a nurse, and one assistant doorkeeper, to attend each of the three clinics, and the necessary public health nurses who could go into the homes of the people with instruction and demonstrations; each clinic to be opened two days a week for two hours each day, for the examination of the patients. In the other towns, the personnel would be adequate to the local requirements.

"Each dispensary will keep a minute clinical report of every patient. Each patient will be visited daily by a nurse who will supply sanitary sputum cups and handkerchiefs and a waterproof bag where all these things will be collected after use; these bags to be collected and burned daily so as to insure the destruction of the bacilli. The doctors will supervise the nurses and instruct the patients and their relatives in the precautions they should take, and will report to the Directorate cases, which by their advanced condition or their poverty, or because of danger of spread of the disease from them—should be sent to hospital. The Directorate will decide on each case after due inspection.

"Wishing to economize as much as possible, the police doctors, or other doctors receiving pay from the Government, when thoroughly qualified and interested in this work, will be chosen for each dispen-

...ing them a small increase of salary to be paid from the fun... ...tuberculosis campaign, to remunerate them for the fo... ...week which each doctor will devote to this work. For porte... ...reference will be given those who have worked in t... ...cities.

The Government taking into consideration this new duty impos... ...inspectors will exact that they have a clinical and bacteriologic... ...knowledge of the detection of the bacilli of Koch, as a *sine qua no*... ...physicians and nurses systematically secure specimens fr... ...and cases exposed to them for examination at the labor... ...tuberculosis and intestinal parasites especially in towns wh... ...the latter exist.

...must not be thought that the government of Panama has been ... ...the work has not made the progress nece... ...markedly lessen the ravages of the disease. For cas... ...employees or in their families or in others brought ... ...during the Canal construction, for whom we have ... ...responsibility, the Canal should establish and conser... ...sanatorium where, while the disease is being arrest... ...could be taught to become self-supporting while d... ...or truck garden work in the open air.

BUILDING INSPECTION.

Since 1913 all building inspection in Panama and Colon has be... ...by the Health Department. A sanitary inspector was detail... ...building inspector. At the suggestion of the Resident Engine... ...Building Division, a competent building inspector has ju... ...transferred to the health office, Panama, who is now givi... ...advice to those desiring to improve buildings in Panam... ...as well as repairing those who have already built them on the wro... ...from a health standpoint to make such modifications as may ... ...necessary. This is one of the most important elements in t... ...working of the health department of the two cities as defective te... ...rooms heretofore erected have been one of the two main caus... ...the rapidly increasing tuberculosis rate, both among our employe... ...and the citizens of the terminal cities. The housing problem in ci... ...Zone deserves as much and as careful study.

A survey of the Paraiso District was made showing that no... ...than 50 of the old native houses had been permitted to remain ... ...which conditions were even worse than in any of those in either of t... ...cities. Besides this, many of the tenants in these miserable pla... ...were colored bachelor women who had been run out of the cities ... ...the venereal campaign. As soon as this was brought to the Gove... ...nor's attention these houses were ordered demolished, but in many ... ...the older type quarters for silver employees over-crowding of t... ...most vicious sort persists and this matter will receive careful a... ...tention and correction as soon as the financial difficulties caused ... ...the war, are overcome. Plans have been submitted to and approve... ...by the Building Division which will make future quarters for t... ...ial orders comply with all the sanitary necessities in the tropics.

GARBAGE, FLIES, AND MANURE.

The absence of flies in the Canal Zone is one of the most striking things to a visitor. It is even more remarkable that they are practically nonexistent in the city of Panama. This is because all manure and garbage are removed and disposed of once each day.

At Corozal Hospital compost pits for manure have been built which are models. They are built square, of concrete and there are six of them together. They are located just at the edge of a little rise so that the carts dumping manure into them drive over the upper road and those loading the cured manure get it from the bottom of each pit on a lower road. The roads are concrete. As each pit is filled it is tightly closed for six or eight weeks. A common drain from all the pits runs into a cistern whose contents are constantly sprinkled over the gardens previous to planting. There is no fly breeding about these pits nor in the cured manure, although the green manure going into them is fairly alive with larvæ.

MEAT INSPECTION.

The inspection of meat and meat products has made rapidly increasing demands on the department. The Canal Zone has not only supplied its own necessities for meat, but has furnished large quantities for the Army. As local beef is finished on grass, it was at first difficult to comply with the standard set by the Army, based on corn-finished stock. Our inspectors have supervised the slaughter of more than 100 head of cattle per day, and the double transshipment and freezing of this meat without adequate facilities. The modern abattoir and cold storage plant being erected at Cristobal will provide the very latest scientific equipment for handling a greater volume of business. A microscopic examination of a smear from the spleen of every animal slaughtered is made for anthrax. From these smears a number of evidently subacute cases of anthrax were discovered which had given no clinical symptoms. Upon the discovery of such cases, killing was stopped, the carcass and everything that came in contact with it was destroyed and the floor and equipment thoroughly disinfected. All meat shipped is under the eye of an inspector until in the refrigerator aboard ship. Meat for local consumption receives the same rigid inspection and the people of the Canal Zone have at all times had an ample supply of beef from healthy cattle. Every patriot here has shared in the pride we all feel that the best looking beef goes to our soldier boys, and this is barely tempered by the fact that what has been retained for home consumption is quite as nutritious, but from smaller cattle.

The opening of the new municipal abattoir in Colon will insure to the residents of that city the same high grade beef and other meat products as obtained by residents of the Zone. The abattoir for Panama has been located and the unsightly and unsanitary structure heretofore used will soon be replaced by modern equipment. It will be necessary to extend our inspection to these abattoirs at once.

EXAMINATION OF SILVER EMPLOYEES.

During the year, in connection with the new photo-metal check system with all employees, a physical examination of the silver employees was undertaken for the first time. As there were between 15,000 and 20,000 of them this involved a considerable amount of work. As slight defects were discovered in these people they were ordered into the hospital for operation or treatment, and the cases which ought not to be at work were sent to Corozal Farm for observation and lighter work. This systematic examination of all employees should be repeated each year and should gradually be extended to their families.

VITAL STATISTICS.

EMPLOYEES.

The average number of employees on the rolls of The Panama Canal and the Panama Railroad, for the year was 25,520, as compared with 32,589 for 1917, and 33,176 for 1916.

The total admission rate to hospitals and quarters was 405.67 as compared with 356.75 in 1917, and 282.76 in 1916. For disease alone the admission rate to hospitals was 136.60, as compared with 124.80 in 1917, and 103.72 in 1916. The total admission rate to hospitals only was 163.17, as compared with 160.85 in 1917, and 140.43 in 1916.

The total death rate was 8.11 as against 7.09 in 1917, 6.03 in 1916, and 5.77 in 1915, and 7.04 in 1914. The death rate from disease alone was 7.13, as against 5.74 in 1917, and 4.58 in 1916.

The constantly noneffective rate from all causes was 11.19, as compared with 9.65 for 1917, and 9.20 for 1916.

The admission rate for malaria, to both hospitals and quarters, was 18.55, as compared with 14.51 for 1917, and 16.49 for 1916. The noneffective rate for malaria was 1.13, as compared with 0.48 for 1917, and 0.59 for 1916.

The admission rate for typhoid fever was 0.24, as compared with 0.18 for 1917, and 0.66 in 1916. No deaths from typhoid fever among employees occurred during the year.

The five diseases causing the highest number of hospital discharges with their rates were as follows:

	1917.		1918.	
	Discharges.	Rate.	Discharges.	Rate.
Influenza	186	5 71	552	21 63
Malaria	449	13 78	432	16 93
Venereal diseases	626	19 21	378	14 81
Tuberculosis	83	2 55	184	7 25
Diseases of the eyes and their annexa	98	3 01	88	3 45

The five diseases causing the highest number of deaths, with their rates were as follows:

	1917.		1918.	
	Deaths.	Rate.	Deaths.	Rate.
Tuberculosis (various organs)	36	1.10	46	1.80
Lobar pneumonia	29	.89	28	1.10
Nephritis (acute and chronic)	21	.64	19	.74
Organic diseases of the heart	22	.67	16	.63
Cerebral hemorrhage	8	.24	6	.24

There were 46 deaths from tuberculosis among employees, as compared with 36 in 1917, and 36 in 1916. From pneumonia 28 deaths occurred among employees in 1918, as compared with 29 in 1917, and 31 in 1916.

EFFECTS OF RACE.

The admission rate to hospitals and death rate from disease, for white employees, was 237.98, and 3.63, as compared with 115.43 and 7.86 for black employees.

The admission rate to hospitals and quarters for malaria was 14.07 for whites, as compared with 19.47 for blacks.

The admission rate to hospitals for disease for Americans was 218.55 and the death rate from disease 3.38.

CANAL ZONE.

EMPLOYEES AND NONEMPLOYEES.

From the average population of 22,290 in the Canal Zone, there was a total of 236 deaths during the year. Of these, 216 deaths were from disease, giving a rate of 9.69 as compared with 9.91 for 1917, and 9.22 for 1916.

The death rate for tuberculosis was 1.84, as compared with 1.31 for 1917. Deaths from tuberculosis this year were 17 per cent of all deaths.

There were 725 births reported during the year, giving a birth rate of 32.69. Of these, 255 were white and 470 black.

There were 60 deaths which occurred among children under 1 year of age, 5 white and 55 black, giving an infant mortality rate based on the number of births reported for the year, of 19.61 for white and 112.77 for black children, with a general average of 127.06 per 1,000 births.

Of the total deaths, 25 per cent occurred among children under 1 year of age, and 38 per cent among children under 5 years of age.

Of the total births reported, 6 per cent were stillbirths.

Below is a table showing the death rates for the Canal Zone from 1905 to 1918, inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year	Population.	Deaths.	Rate per 1,000.
1905	23,463	828	35 29	1912	79,279	1,129	14.24
1906	34,095	1,700	49 86	1913	61,700	1,047	16 97
1907	54,036	1,708	31 60	1914	46,379	710	15 31
1908	67,146	1,273	18 95	1915	31,946	410	12 83
1909	76,900	1,025	13 33	1916	31,447	343	10 91
1910	86,465	1,251	14 47	1917	27,543	313	11 36
1911	90,434	1,385	15 32	1918	22,290	216	9 69

Average population, excluding military population for last six months of 1917 and for the year 1918.

Panama City.

EMPLOYEES AND NONEMPLOYEES.

The population of the city, as shown by the health department census of June, 1917, is 61,369.

From a population of 61,369, there was a total of 1,314 deaths during the year. Of these 1,284 were from disease, giving a rate of 20.92, as compared with 27.19 for 1917, and 28 for 1916.

The principal causes of death, as compared with last year, were as follows:

	1917.	1918.
Tuberculosis (various organs)	319	254
Diarrhea and enteritis (including colitis)	332	165
Pneumonia (lobar and broncho)	213	146
Nephritis (acute and chronic)	92	90
Organic diseases of the heart	80	63

The death rate from tuberculosis was 4.14, as compared with 5.22 for 1917, being 19 per cent of the total deaths this year, as compared with 18½ per cent for 1917.

There were 2,308 births reported during the year, giving a birth rate of 37.61.

There were 412 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported for the year, of 178.51.

Of the total deaths, 31 per cent occurred among children under 1 year of age, and 42 per cent among children under 5 years of age.

Of the total births reported, 7 per cent were stillbirths.

Below is a table showing the death rate in Panama City from 1905 to 1918, inclusive, including deaths for all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	21,984	1,447	65 82	1912	47,057	1,380	29 33
1906	25,518	1,142	44 75	1913	47,172	1,507	31 95
1907	33,548	1,156	34 45	1914	53,948	1,863	34 53
1908	37,073	1,292	34 83	1915	60,373	1,810	29 98
1909	40,801	1,038	25 44	1916	60,778	1,765	29 04
1910	45,591	1,446	31 72	1917	61,074	1,714	28 06
1911	46,555	1,456	31 27	1918	61,369	1,314	21 41

COLON.

EMPLOYEES AND NONEMPLOYEES.

From an average population of 26,078, a total number of 616 deaths occurred during the year. Of these, 587 were from disease, giving a rate of 22.51 from disease alone, as compared with 25.29 for 1917 and 26.81 for 1916.

The principal causes of deaths, as compared with last year, were as follows:

	1917.	1918.
Tuberculosis (various organs)	113	116
Pneumonia (lobar and broncho)	95	91
Diarrhea and enteritis (including colitis)	74	54
Bronchitis (acute and chronic)	55	51
Nephritis (acute and chronic)	61	45

The death rate from tuberculosis was 4.45, as compared with 4.45 for 1917, being 19 per cent of the deaths this year, as compared with 17 per cent for 1917.

There were 795 births reported during the year, giving a birth rate of 30.48.

There were 148 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported for the year of 186.16.

Of the total deaths, 24 per cent occurred among children under 1 year of age, and 37 per cent among children under 5 years of age.

Of the total births reported, 8 per cent were stillbirths.

Below is a table showing the death rate in Colon from 1905 to 1918, inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	11,176	553	49 48	1912	20,174	493	24 44
1906	13,651	703	51 42	1913	20,232	489	24 17
1907	14,540	571	39 24	1914	23,265	590	25 36
1908	15,878	418	26 32	1915	29,331	640	21 82
1909	17,479	396	22 65	1916	24,693	696	28 19
1910	19,535	514	26 31	1917	25,386	667	26 27
1911	19,947	527	26 42	1918	26,078	616	23 62

X-RAY CLINIC.

In January this clinic was moved to its perma
now located in the north wing, first floor, Ad
Building. The rooms occupied are office for Chi
and Therapeutic Room, transformer and machine
room, file room, supply storeroom, and white an
waiting rooms.

The following new equipment was installed:
former; horizontal-vertical fluoroscope; localizi
and gas tubes for radiegraphic, fluoroscopic, e
Two thousand four hundred and twenty-three
6,243 plates and 687 dental films taken, 49 treat

LINEN ROOM.

In February, three rooms (one a large storage
in basement as linen rooms. The work was
qualified nurse with three colored seamstresse
tendants. Preparation of linen for hospital pu
centrated in the hospital linen room, thereby eff
and efficiency in handling linen supplies.

All linen is received direct from Ancon laund
all articles receiving a rigid inspection before
nec. ssary repairs made at once. Surveyed sho
messes and hotels, etc., are utilized whenever e
bandages, vulvar pads, etc., instead of using ne

DISEASES.

The new isolation building was occupied in
story reinforced concrete building, with basem
capacity of about 90 patients.

In the basement are located orderlies' room, r
and doctors' office, sterilizing rooms, elevator
etc. On the first floor are located two 4-bed w
with all necessary service rooms, kitchen, pl
office and bedroom, colored helpers' rooms,
third floors have each two 11-bed wards, 3 priv
sary service rooms, dining room, pantry, kitch
rooms, etc.

The hospital was congested at times since Ju
of epidemic influenza cases treated, with pneum

One hundred and twenty-six cases of sm
during the year with no deaths. Three thou
forty-five adults were vaccinated with 1,119 kn
school children with 98 known "takes."

NURSES' QUARTERS.

The new nurses' quarters is a three-story
forced concrete building, containing 69 bedroo
an office, tea room, kitchen adjoining, and ro
basement a small laundry and trunk storeroom

MOVEMENT OF PATIENTS, NONRESIDENTS OF CANAL ZONE.

	1917.	1918.
Total number treated:		
Ancon Hospital	274	510
Corozal Hospital	76	76
Total	350	586
Died:		
Ancon Hospital	7	9
Corozal Hospital	3	10
Total	10	19
Days treated:		
Ancon Hospital	5,101	7,867
Corozal Hospital	21,396	20,431
Total	26,497	28,089

CHRONIC PATIENTS.

	1918.	1917.	1916.	1915.	1914.[1]	1913.
Total number treated	38	63	52	58	55	
Total number days treatment	9,603	9,836	9,174	9,801	3,409	
Average number patients per day	26	27	25	26	28	
Average per capita cost	0 2602	0 2520	0 2400	0 2503	0 327	

[1]September 1 to December 31, 1914.

MOVEMENT OF MILITARY PATIENTS.

	1918.	1917.	1916.	1915.	1914.	1913.
Total number of admissions	4,165	2,469	1,937	1,771	1,458	394
Total number of days relief	49,067	33,494	28,519	24,643	19,506	5,850
Number constantly sick	134 49	91 76	78 13	67 51	53 40	16 00

GAUZE USED.

Yards	14,750	80,725	87,585	105,825	132,744	182,699
Cost	$867 44	$2821 39	$2159 78	$2685 22	$3612 22	$4169 80

BANDAGES USED.

Dozens	440½	1,559½	1,871	2,311	2,077	2,416
Cost	$283 02	$945 79	$900 61	$1115 59	$1062 75	$1401 25

STATISTICAL SUMMARY.

Cases admitted to Ancon Hospital during year	12,153
Cases admitted to Corozal Hospital during year	229
Chronics admitted to Chronic Ward during year	15
Crippled employees to Corozal Farm during year	39
Total	12,436
Major surgical operations	1,784
Minor surgical operations	4,424
Eye and ear operations	1,088
Total	7,296
Refractions	1,312
Obstetrical cases delivered	321
Deaths during year in Ancon Hospital	336
Deaths during year in Corozal Hospital	73
Total	409
Out-patient Dept. (Medical, Surgical, Eye and Ear Clinics):	
Total visits	14,276
New cases	7,760
Prescriptions written	4,230
Dispensary (District Physician) total treated	92,201

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In 20 sputums examined streptococci were found to be the predominating organisms, 10 varieties having been determined. Of these 3 were hemolytic, 3 green producers, and 4 with no zone or color formation. Of the green producing streptococci, 1 is of special interest in that it decolorizes blood corpuscles without destroying them, thus apparently occupying a middle ground between the hemolytic and nonhemolytic streptococci. This organism was isolated in every one of a group of 7 sailors from Coco Solo.

Among all these streptococci there was a strong tendency to diplococcus formation, but in no instance was capsule formation or bile solubility observed. In the absence of the latter characteristic we have not considered any of these organisms pneumococci.

Pathological Report.

During the calendar year of 1918, 253 autopsies were performed, the causes of death being as follows:

General diseases.

Malaria, estivoautumnal	6
Pyemia	2
Pellagra	3
Tuberculosis of the lungs	57
Tuberculous meningitis	6
Potts' disease	1
Tuberculosis, disseminated	5
Syphilis, tertiary	3
Cancer of the liver	1
Cancer of the uterus	1
Cancer	3
Diabetes	1
Sarcomatosis	1
Leuchemia (lymphatic)	1
Septicemia	1

Diseases of the nervous system and of the organs of special sense.

Simple meningitis	2
Cerebrospinal meningitis	3
Meningitis pneumococcic	5
Meningeal hemorrhage	1
General paralysis of the insane	1
Epilepsy	2
Apoplexy	5
Cerebrospinal syphilis	1
Concussion of the brain	1
Dementia precox	1
Exhaustive psychosis	1

Diseases of the circulatory system.

Malignant endocarditis	1
Organic diseases of the heart	8
Aneurysm	4
Arteriosclerosis	10
Hemorrhage	1
Rupture of the coronary artery	1
Post-operative hemorrhage	1

Diseases of the respiratory system.

Broncho-pneumonia	9
Lobar pneumonia	29
Empyema	1
Gangrene of the lungs	1
Pleurisy (acute fibrinous) with effusion	1
Acute bronchitis	1
Edema of the lungs	1

Diseases of the digestive system.

Diarrhea and enteritis (under 2 years)	1
Colitis	2
Diarrhea and enteritis (2 years and over)	2
Cirrhosis of the liver	1

Stricture of esophagus	3
Dysentery, entamebic	1
Abscess of the liver, unqualified	2
Acute peritonitis (simple)	3
Acute peritonitis (purulent)	1
Uncinariasis	2
Ischio-rectal abscess	2
Acute gastritis	1
Acute interstitial hepatitis	2

Nonvenereal diseases of the genito-urinary system and adnexa.

Acute nephritis	2
Chronic nephritis	12
Pyelo-nephrosis	3

The puerperal state.

Puerperal septicemia	1
Puerperal hemorrhage	1
Hyperemesis gravidarum	1

Diseases of early infancy.

Atrophy of infants	1
Malnutrition	19

Affections produced by external causes.

Acute poisonings	1
Accidental drownings	1
Traumatism (railroads)	1
Homicide by cutting instruments	1
Fracture of the skull	1
Dislocation of cervical vertebra	1
Cause undetermined	2

The most frequent causes of death recorded in the above series of autopsies were as follows:

	Cases.	Per cent.
Tuberculosis	68	26 8
Pneumonia	38	15
Malnutrition	19	6 5
Chronic nephritis	12	4 7
Arteriosclerosis	10	3 9
Organic heart disease	8	3 1

The pathologist has collected interesting data showing the principal causes of death found at autopsy from 1904 to 1917, inclusive, and the variety of some diseases (cholera, plague) that are prevalent in many tropical countries. We shall present his tables, adding the records for 1918:

TABLE I.—*Showing the more common causes of death at autopsy in the Board of Health Laboratory.*

Date.	Number of autopsies per year.	Pneumonia.	Tuberculosis.	Hæmoglobinuric fever, malaria.	Affection produced by external causes.	Chronic nephritis.	Combined types of dysentery.	Organic heart disease.	Typhoid.	(Children), diarrhœa and enteritis	Cancer.
1904	6	1	1								
1905	269	60	9	27	3	8	5	3	9		2
1906	509	191	22	50	24	23	39	15	33		2
1907	496	156	35	27	40	27	36	12	58	4	4
1908	361	59	63	46	26	25	23	11	14		7
1909	295	55	37	26	32	31	11	17	11	1	5
1910	451	50	91	52	30	37	36	16	10	6	4
1911	508	83	102	41	38	36	19	20	9	11	11
1912	425	53	79	23	37	27	15	22	6	7	11
1913	460	47	89	21	34	26	8	26	5	23	12
1914	375	36	78	6	38	12	6	27	5	14	3
1915	328	28	56	14	20	12	5	14	2	15	10
1916	323	25	81	8	17	20	7	10	6	9	7
1917	330	24	51	5	21	23	3	18	1	3	5
1918	253	38	68	6	6	12		8		1	5
Total	5,389	906	854	352	366	319	213	219	169	94	89

TABLE II.—*Showing number of autopsies performed revealing the following diseases per year.*

Date.	Autopsies performed per year.	Yellow fever.	Beriberi.	Ankylostomiasis.	Tetanus.	Infectious diseases of children.	Plague.	Smallpox.	Snake-bite.	Cholera.	Filariasis.
1904	6										
1905	269	12	7	7	2		1				
1906	509	1	5	4							
1907	496		1	2	1						
1908	361		1	2	3						
1909	295	2					1				
1910	451	2									
1911	508		1	1	1		1				
1912	425	1			1	4					
1913	460			2	3	1					
1914	375		1		4	2					
1915	328	3	1		2	1					
1916	323		2			3		1			
1917	330		7		1	2					
1918	253			2		3					
Total	5,389	21	26	20	18	16	3	1			

Five hundred and seventy bodies passed through the laboratory during the year, of which 253 or 44.4 per cent were autopsied. Seventy-nine bodies were embalmed and 256 were cremated.

X-RAY CLINIC.

In January this clinic was moved to its permanent quarters and is now located in the north wing, first floor, Administration-Clinics Building. The rooms occupied are office for Chief of Clinic, X-Ray and Therapeutic Room, transformer and machinery room, developing room, file room, supply storeroom, and white and colored patients' waiting rooms.

The following new equipment was installed: High tension transformer; horizontal-vertical fluoroscope; localizing devices; Coolidge and gas tubes for radiographic, fluoroscopic, and treatment work. Two thousand four hundred and twenty-three cases were handled, 6,243 plates and 687 dental films taken, 49 treatments given.

LINEN ROOM.

In February, three rooms (one a large storage room) were set aside in basement as linen rooms. The work was placed in charge of a qualified nurse with three colored seamstresses and two male attendants. Preparation of linen for hospital purposes has been concentrated in the hospital linen room, thereby effecting great economy and efficiency in handling linen supplies.

All linen is received direct from Ancon laundry and redistributed, all articles receiving a rigid inspection before being sent out, and necessary repairs made at once. Surveyed sheets, table linen from messes and hotels, etc., are utilized whenever obtainable for making bandages, vulvar pads, etc., instead of using new gauze.

DISEASES.

The new isolation building was occupied in July. It is a three-story reinforced concrete building, with basement, and has a normal capacity of about 90 patients.

In the basement are located orderlies' room, receiving ward, nurses' and doctors' office, sterilizing rooms, elevator machinery, storeroom, etc. On the first floor are located two 4-bed wards, 9 private rooms, with all necessary service rooms, kitchen, physicians' and nurses' office and bedroom, colored helpers' rooms, etc. The second and third floors have each two 11-bed wards, 3 private rooms, and necessary service rooms, dining room, pantry, kitchen, offices, examining rooms, etc.

The hospital was congested at times since July due to the number of epidemic influenza cases treated, with pneumonia complications.

One hundred and twenty-six cases of smallpox were admitted during the year with no deaths. Three thousand five hundred and forty-five adults were vaccinated with 1,119 known "takes;" and 187 school children with 98 known "takes."

NURSES' QUARTERS.

The new nurses' quarters is a three-story with basement reinforced concrete building, containing 69 bedrooms, two sitting rooms, an office, tea room, kitchen adjoining, and reception room, and in basement a small laundry and trunk storeroom.

STEWARD'S DEPARTMENT.

The new kitchen-mess halls building, which was occupied in March, reinforced concrete structure of two stories, with basement under t of south end of structure. New kitchen and dining room equipt was installed at a cost of $10,000.

In the basement are located the bake shop, refrigerating machinery m, elevator machinery room, diet dispatch room, locker room, and ts for kitchen help.

On the first floor are the refrigerating boxes (three small compartnts for eggs, milk, vegetables, and one large box for meats.. etc., a freezing room), butcher shop, storeroom, diet kitchen, scullery, ing rooms for colored attendants, patients, and personnel, male d female.

On the second floor also there are dining rooms for doctors and rses, and white convalescent patients with service room common both, food being handled on three electric dumb-waiters.

Electric heating has supplanted ranges burning coal and charcoal. The ovens of bakery are designed to burn fuel oil.

The power plant is located in building immediately adjacent to the kitchen. Two new 40-horsepower cylindrical return tube boilers, burning oil as fuel, were put in operation the latter part of June.

One hundred and eighty-two thousand three hundred and thirty-two rations were issued to hospital patients and 69,136 rations to personnel entitled to same; a total of 251,468 rations at a cost of $79,216.57.

Twenty-four thousand seven hundred and forty-five rations were ssued to pay mess boarders, repayment for which amounted to $17,162.81.

One hundred and forty-four thousand one hundred and forty-three pounds of bread were baked from 110,644 pounds of flour at a cost of $8,991.09.

ANCON HOSPITAL COMPARATIVE STATEMENT.

	1918.	1917.	1916.	1915.
Report of patient days	319,908	311,451	270,294	268,945
Cost of subsistence per patient per day	$0 315	$0 3369	$0 2522	$0 2372
	1914.	1913.	1912.	1911.
Report of patient days	338,901	423,251	415,009	424,416
Cost of subsistence per patient per day	$0 253	$0 217	$0 209	$0 213

MOVEMENT OF PATIENTS, NONRESIDENTS OF CANAL ZONE.

	1917.	1918.
Total number treated:		
Ancon Hospital	274	510
Corozal Hospital	76	76
Total	350	586
Died:		
Ancon Hospital	7	9
Corozal Hospital	3	10
Total	10	19
Days treated:		
Ancon Hospital	5,101	7,667
Corozal Hospital	21,396	20,431
Total	26,497	28,089

CHRONIC PATIENTS.

	1918.	1917.	1916.	1915.	1914.[1]	1913.
Total number treated	38	63	52	58	55	
Total number days treatment	9,603	9,836	9,174	9,801	3,409	
Average number patients per day	26	27	25	26	28	
Average per capita cost	0 2602	0 2520	0 2400	0.2503	0 327	

[1]September 1 to December 31, 1914.

MOVEMENT OF MILITARY PATIENTS.

	1918.	1917.	1916.	1915.	1914.	1913.
Total number of admissions	4,165	2,469	1,937	1,771	1,458	394
Total number of days relief	49,067	33,494	28,519	24,643	19,506	5,850
Number constantly sick	134 49	91 76	78 13	67 51	53 40	16 00

GAUZE USED.

Yards	14,750	80,725	87,585	105,825	132,744	182,699
Cost	$867 44	$2821 39	$2159 78	$2685 22	$3612 22	$4169 80

BANDAGES USED.

Dozens	440½	1,559½	1,871	2,311	2,077	2,416
Cost	$283 02	$945 79	$900 61	$1115 59	$1062 75	$1401 25

STATISTICAL SUMMARY.

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Total	5,389	906	894	352	366	319	213	219	169	94	89

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1909	295	2	...	...	...	...	1	...	...	...	...
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1912	425	1	...	...	...	4	...	...	...	...	...
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Total	5,389	21	26	20	...	...	3	1	...	...	...

Five hundred and seventy bodies passed through the laboratory during the year, of which 253 or 44.4 per cent were autopsied. Seventy-nine bodies were embalmed and 256 were cremated.

During the year 15,642 Wasserman tests were performed on 11,992 persons including 1,167 prostitutes, as compared with 12,543 tests on 9,561 persons during the pervious year. The results of these tests are summarized in the following tables:

Wasserman Reactions During the Year 1918.

(Based on the number of individuals examined and not on the number of tests made.)

	Positive.	Negative.	Total.	Per cent positive
White, civil:				
Males	178	1,388	1,566	11.3
Females	34	729	763	4.4
Children	1	15	16	6.2
White, soldiers, males	437	3,135	3,572	12.2
Total	650	5,267	5,917	10.9
Spanish and white natives:				
Males	106	341	447	23.7
Females	16	86	102	15.7
Total	122	427	549	22.2
Blacks and mulatoes:				
Males	1,008	2,310	3,318	30.0
Females	222	723	945	23.5
Children	8	55	63	12.7
Total	1,238	3,088	4,326	28.6
Chinese, males	10	23	33	30.3
Grand total	2,020	8,805	10,825	18.6
Prostitutes	642	525	1,167	55.0
Grand total (including prostitutes)	2,662	9,330	11,992	22.2

In addition Wasserman tests were made on 373 spinal fluids from as many individuals and of these 95 or 25.2 were positive.

During the year 687 throat cultures were examined for diphtheria of which 71 were found positive. The number of positive cases repeated were 26. Wasserman examinations were in excess of those of the previous year and their results are given herein.

Work of the chemical laboratory included quantitative and qualitative analysis of a varied nature. For analysis food products and commissary supplies were received from the Supply Department, fuel oils and metals from the Mechanical Division, fertilizers and soil from the Cattle Industry Division, drugs from the Medical Storehouse, milk and food products from the health offices and a great variety of material from private individuals. Specimens submitted by the hospital were of the usual routine clinical nature, urines, stomach contents, mother's milk, milk, and 335 spinal fluids upon which colloidal gold reactions and butyric acid, phenol and ammonium sulphate tests for globulin were made. Other than spinal fluids chemical examinations for the year numbered 528.

Entomological Department.

In the department of entomology, attention has principally centered upon classification and study of insect life injurious to food plants and fruit trees in the Canal Zone. Much of this investigation

was conducted in conjunction with a representative of the Department of Agriculture and its salient features are enumerated under a separate heading.

Medical entomology.—This consisted largely of the routine examination and determination of mosquito larvæ and adults, inspections of breeding areas and cattle camps, identifications of diptera other than mosquitoes, examination of food products for insect pests, and the determination of ticks and other arthrepods. This department cooperated with the United States National Museum by sending to Dr. Harrison G. Dyar, an authority on American mosquitoes, both larvæ and adults of Panamic forms. As a result of this, the following new species of *Culex* described by Doctor Dyar are added to our fauna: *C.* (*Chæroporpa*) *tecmaria*, *C.* (*Helcoporpa*) *menytes*, *C.* (*Melanoconium*) *dunni*, *C.* (*Melanoconium*) *zeteci*, and *C. Leucotelus*.

A study was begun of the ecology of Anopheles larvæ and adults, intended primarily to learn definite environmental conditions peculiar to each species.

The following table gives the record of identifications of mosquitoes made:

Mosquito Larvae.

Culicini—		
Anopheles albimanus		65
Anopheles tarsimaculata		2
Anopheles argyritarsis		120
Anopheles pseudopunctipennis		138
Anopheles malefactor		18
Anopheles apicimacula		2
Anopheles eiseni		1
Total anopheles	lots.	346
Aedes argenteus (=aloprs)		16
Aedes spp.		12
Culex (16 spp.)		195
Lutzia allostizma		2
Haemogogus (3 spp.)		16
Mansonia (2 spp.)		3
Uranotaenia (2 spp.)		23
Psorophora, Orthopodomyia, etc		12
Total culicini nonanopheles		279
Sabethini—		
Wyeomyia, Limatus, etc (6 spp.)		11
Total number of lots of larvae		636

Mosquito Adults.

Culicini—		
Anopheles albimanus		5,186
Anopheles tarsimaculata		178
Anopheles argyritarsis		11
Anopheles pseudopunctipennis		696
Anopheles malefactor		68
Anopheles apicimacula		1
Total anopheles	spms	6,440

Mosquito Adults—Continued.

Culicini—Continued.

Aedes argenteus (-calopus)		89
Aedes taeniorhynchus		1,083
Aedes spp		8
Mansonia titillans		4,049
Mansonia nigricans		117
Mansonia fasciolatus		164
Aedeomyia squamipennis		10
Culex quinquefasciatus		538
Culex spp		710
Psorophora posticata		11
Lutzia allostigma		2
All others		43
Total cumilina nonanopheles	spms	6,824
Sabethini—		
Sabethes, Wyeomyia, Limatus, etc		74
Total number of adults	spms	13,338

During the months of July to October, inclusive, determinations of mosquitoes were practically discontinued in order to devote as much time as possible to the study of mill insects.

The following adult mosquitoes were examined for the presence of microfilariæ; same came from inside the nets in the bunks at cattle camps: 59 *Anopheles albimanus*, 28 *Anopheles pseudopunctipennis*, 181 *Mansonia titillans*, and 2 *Mansonia nigricans*. None were found.

Economic entomology.—Practically all this work was done with the cooperation of Mr. H. F. Dietz of the Bureau of Entomology, U. S. Department of Agriculture. A total of 385 distinct accessions were sent to the Bureau of Entomology, U. S. Department of Agriculture, for record and accurate determination. The following places were inspected: Plantations at Limon, Juan Mina, Bracho, Corozal, Venado, Summit, and several in the Las Sabanas region of Panama City; all piers and towns; warehouses and packing rooms of the Commissary Division at Cristobal and Mount Hope; the Mindi dairy farm and the Summit chicken farm. The following are among the more important insect pests found, arranged according to hosts:

Citrus.—The spiny citrus white fly, *Aleurocanthus woglumi*, at present confined to the terminal towns and parts of Las Sabanas and Tabega, is a serious pest and already 20 other hosts have been found for it on the Isthmus. It was probably introduced from the Hope Gardens of Jamaica, and as it is not as yet in the United States, special attention is given to prevent its introduction there. Another white fly, *Aleurothrixus flocosus*, was found at Juan Mina, but it is not serious; it is, however, very abundant on frangipanny, *Plumeria alba*. The following scales were found but their control is relatively simple: *Selenaspidus articulatus*, *Chrysomphalus aonidum*, *Lepidosaphes beckii*, and *Saissetia nigra* and *hemisphærica*; The bee, *Trigona ruficus corvina*, is very destructive to the young leaves, as is also the red-eyed citrus grasshopper. A stinging ant was found at Juan Mina to girdle the trunks of young trees and thus caused much real damage.

Papaya.—The papaya fruit fly, *Toxotrypana curvicauda* Gerst., was found at Balboa, Ancon, and Las Sabanas. It promises to

become a very serious pest of papaya fruit and difficult to control. The scale *Diaspis pentagoni* is quite common on trunks of papaya and a few trees were found dead, killed apparently by this scale.

Palms.—The principal pest of palms is the Isthmian coconut caterpillar, *Brassolis isthmiæ*, which causes heavy damage to the crowns. A power sprayer has been ordered and should be of great service in the control of such pests.

Banyan—(Ficus indica).—The banyan thrips, *Gynaikothrips uzeli*, is very abundant on all banyans seen. The scales *Chrysomphalus dictyospermi* and *personatus* are also present but do much less damage.

Bamboo.—All bamboo seen, almost, has scales, and some of them are very abundant, but as yet no signs of actual damage to the plant was noted.

Ornamental plants.—Selanaspidus articulatus and *Chrysomphalus aonidum* are very abundant, and spraying will be necessary in order to keep these pests under control.

Mango.—The glassy star scale, *Vinsonia stellifera*, is very abundant. The spiny citrus white fly is on mango as well but not heavy. Sooty mold at times is quite heavy. The most serious pests of mango is the mango weevil, *Sternochetus mangiferæ*, two specimens of which are in the collection.

Avocado pears.—At Frijoles a pyralid was doing some damage to leaves, but no indications of weevil injury were noted. At Ancon two specimens of a weevil very similar to *Heilpus lauri*, the avocado weevil, was found on the leaves of a small tree of this species. It is a serious pest once it becomes established.

Sour sop.—A tree near the laboratory was completely covered with the giant white fly, *Aleurodicus giganteus*, but nowhere else has this pest been found.

Sugar cane.—The West Indian sugar cane borer, *Metamasius sericeus*, was found breeding abundantly in banana stumps. This is a most serious pest of cane, and one easily introduced elsewhere.

Several species of fruit flies were bred out or found about fruit on piers, indicating that pests of this sort will be a continuous source of trouble here, and as they are hard to control, they will always cause much damage.

A large number of other economic and beneficial insects were collected and a general report will be published in an entomological journal covering the entire work in economic entomology.

Considerable time was given to the study of stored food products insects at Cristobal and Mount Hope. Due to inadequate warehouse facilities and to the strained conditions brought about by the war, the Isthmus was not prepared to store large quantities of food products, and as a result mill insects increased rapidly. Those most abundant were the following: Two species of moths, the rice weevil (*Calandra oryza*), Cadelle (*Tenebroides mauritanicus*), confused flour beetle (*Tribolium confusum*), rust-red flour beetle (*T. ferrugineum*), saw-toothed grain beetle (*Silvanus surinamensis*), foreign grain beetle (*Cathartus advena*), rust-red grain beetle (*Læmophloeus ferrugineus*), cigarette beetle (*Lasioderma serricorne*), and the coffee bean weevil (*Araecerus fasciculatus*). *Zabrotes pectoralis* was very abundant in beans and caused much damage. Where food products were badly

infested, they were condemned. As no heat fumigation was possible with the means at hand, our control measures consisted of the following: Carbon bisulfide fumigation for rice and corn and subsequent blowing. For flour, double siftings were practiced, and at the warehouse sacks were placed on racks, the buildings kept clean of all spilled flour and débris, adult insects were collected in grease traps at lights, and hand swatting was practiced to some extent. These measures reduced our infestation to a minimum. Later on a vacuum cleaner was added to the outfit and was very efficacious in keeping sacks clean of insects on the outsides.

Much experimental work was done with various fumigants to learn which were best for the control of mill insects, especially in the tropics. None were as thoroughly effective as heat at 140° F. for several hours. Samples of flour fumigated with hydrocyanic gas, carbon bisulfide, sulphur dioxide, pyrethrum, and heat, were kept each in tightly sealed glass jars for four months, the sulphur sample was brown and full of insects, the same was true of pyrethrum. Hydrocyanic gas had a few live larvæ, while carbon bisulfide and heat were absolutely 100 per cent effective. Of the two the heat was considered the best treatment.

Several species of mill insects were used in similar experiments; equal numbers were placed in single and triple pill boxes and these subjected to the various fumigants. After a fumigation they were examined and condition was noted; the same boxes were reexamined 24 hours later. With HCN we found that some of the rice weevils, apparently dead right after the fumigations, revived 24 hours later. The best results were obtained with heat and CS_2. A detailed report on these experiments is in preparation.

Surveys were made of all piers to note the presence of insects in cargoes which are serious pests and would likely be introduced at other ports through the channels of commerce. Much cacao, coffee, beans, flour, etc., were found infested, suggesting strongly the need of a vacuum fumigation unit at piers to fumigate such cargo and prevent the dissemination of pests over the whole world. The most important pest found was a tiny borer in ivory nuts which completely riddles these hard nuts. A shipment of several thousand sacks was completely infested, and these beetles were over the whole pier. Very close relatives of these, *Platypus* sp. and *Pyleborus grenadensis*, were found at Balboa and elsewhere boring freely into Sanday and other woods. These woods are used for crates, furnishing a splendid medium for the dissemination of pests throughout the world.

A systematic catalogue of the mollusks of Panama was published in the *Revista Nueva*, of Panama City, enumerating almost 900 species of mollusks from the Bay of Panama.

SEPARATE ADMINISTRATION.

I desire to recommend that the Board of Health Laboratory be separated as an administrative unit from Ancon Hospital. All of the organizations in the health department, as well as in the Republic of Panama, should be and are free to call upon this laboratory

for assistance at any time and the necessity of the duplication of reports made necessary by its connection with Ancon Hospital should be avoided.

During the year four young women technicians were added to the staff of the laboratory doing the routine work so that the chiefs of the various services would have more time for matters of special importance. The number of these technicians should be increased so that routine laboratory investigations can be undertaken for all of the hospitals.

COROZAL HOSPITAL.

No new buildings have been erected in the hospital. The isolation ward on the male side had to be turned over for use of working patients and we have no accommodations for tubercular or other contagious diseases.

The population for the close of the year was 216 males and 174 females, and at one time the population has gone up as far as 400. It is very essential that a new structure be erected soon to accommodate the population, which shows a tendency to increase.

We have continued to deport charity patients to their native homes, as soon as authority was given, but this has failed to relieve congestion.

During the dry season several wards were painted by the working patients, making the wards much brighter and more cheerful.

Various forms of amusements were continued, with the exception of band concerts, which were discontinued several months ago. It is hoped, as soon as the condition of the Army on the Isthmus becomes more routine, to obtain band concerts again. Occupational treatment has been continued with success, our garden producing $347 for the month of November and $306 for the month of December. Some of the female patients, besides making rugs, hats, etc., are being taught gardening, and it is hoped in the near future to turn over a part of the land to them for cultivation.

Permission has been obtained to establish a training school for orderlies and maids and steps are underway to organize the school. This will alleviate the great difficulty of getting nurses in the States. Orderlies and maids will be trained to assume charge of the wards, administer cold packs and drugs, but to be supervised by a gold employee. This plan will reduce the cost to a great extent.

The grounds within the hospital enclosure were turned over to the care of the male and female patients, respectively, which work they have carried out with great success.

FARM DEPARTMENT.

The farm has been reorganized. An expert farm manager has made large additions to the ground in cultivation and had it not been for several increases in pay given to the crippled employees during the past year the farm would have been on a paying basis now. Labor-saving machinery has been introduced, the cripples are more contented and the garden products are in increasing demand. Ar-

rangement by which patients are paid a small sum for work has greatly increased their interest and a large percentage of the inmates of the asylum are now busy in the gardens. When one sees these happy, productive, though insane laborers, actually making a living, it seems a pity that this form of therapy can not be introduced into the saner population of the tropics.

Dairy.

The dairy is conducted entirely by crippled and insane laborers. It is a profitable investment and furnishes a reliable source of excellent milk which is sold through the commissary on prescriptions for children. The raw milk of this dairy rarely has a bacterial count higher than 500 and the pasteurized product has never exceeded 50. This is due to the immediate cooling, pasteurization, and bottling of the milk.

Piggery.

We have continued the slop feeding of hogs with crippled and insane labor, developing a very profitable industry. With the new plant most of the slop from the Pacific end of the Isthmus will be converted into food in this plant.

Poultry.

With the development of the modern poultry plant of the Supply Department at Summit the necessity for the conduct of a poultry plant by the health department ended. This plant has been expensive and regularly nonproductive.

GENERAL REMARKS.

As previously recommended, new buildings for the patients should be erected, on a plan similar to the insane hospitals in the United States, whereby we could improve on the treatment of the patients and give them better care. The construction of an industrial building where the patients could be taken and taught various occupations and where adequate machinery could be installed for making brooms, brushes, slippers, mops, is suggested. This would facilitate the handling of the patients and enable us to find employment for many more, which would materially reduce the cost of running, not only for this hospital but for the health department, as these things could be made for the whole department. Many of the cripples whose work in the garden is unsatisfactory could be taught this kind of work, and, incidentally make them more useful to the community and less chargeable.

Most of our laundry is at present done by patients by hand and steps should be taken to secure some machinery. With the installation of this machinery we would be able to do all the laundry for this hospital, as well as for Ancon Hospital.

COLON HOSPITAL.

Hospital operations—The medical and surgical dispensaries are daily taxed to their limit and upon several occasions every available bed in the hospital has been occupied.

From the medical side the recent influenza epidemic with the importation of 22 soldiers from the transport *Kilpatrick* is to be noted. Ten of the 22 died.

On the surgical side the monthly average has been in the neighborhood of 90 major operations.

The cooperation of the hospital with the Colon prophylactic station in "cleaning up" the red light district is of especial interest. In combating this type of affliction, one must first get at and remove the source. Without this preliminary step all treatment is useless because reinfection is continually taking place. This was proven by the observations at the prophylactic station in comparing the cases that had been operated and those upon whom section had not been done.

It is also of interest to note that these people may have existing pus tubes, infected ovaries, and large walled-off abscesses and still be up and about without any apparent discomfort.

Laparotomy was performed upon 60 women. There were no deaths. The ages varied from 14 years up. The average stay in the hospital was from 10 to 20 days, the majority being discharged on about the twelfth day. Practically every nationality was represented.

Preoperative treatment consisted in enemas and douches and because of the fact that all cases were pus, cathartics were not resorted to until post operatively. It was noted that where this procedure was used convalescence was much shorter and that the post-operative course was uneventful.

At laparotomy all diseased tubes, ovaries, and the appendix were removed and wherever practicable hysterectomy was performed. In cases where the uterus was retained, especial attention was paid to carefully shorten the round ligaments that the uterus would properly drain.

Only in extreme cases was drainage resorted to. Due to the repeated infections an acquired immunity existed and absorption took place without any prolonged untoward symptoms.

While still in the hospital, douches were given daily and where the Wasserman was positive, mixed treatment was instituted. This was continued at the prophylactic station with the addition of salvarsan.

It is of especial interest to compare the course while under treatment of operative and nonoperative cases. Those laparotomized cleared up in a very short while, felt better, while the mental effect of having had the diseased portions removed led many of them to express the desire that they wished to leave the district and engage in an honorable calling. In the cases not operated, the source of infection remained; reinfection was continually taking place and very few were permanently benefited by local treatment.

PALO SECO LEPER COLONY.

In June mosquitoes and midges became very numerous; a gang of men cleared the brush from about the buildings and the insects disappeared. Two cases of malaria were noted, both mild. During the Spanish influenza outbreak 7 patients and 4 employees had mild attacks, but soon responded to treatment.

During the year there were 21 admissions, 4 discharges (2 by escape), 8 deaths, with 76 patients remaining in the asylum on December 31.

At the close of the year 72, or 94¾ per cent, of the patients were taking the chaulmoogra oil treatment with marked alleviation of symptoms in many cases.

PANAMA HEALTH OFFICE.

Malaria.—The following table shows the cases of malaria chargeable to the city of Panama in the years 1914 to 1918, inclusive:

1914	2,154
1915	614
1916	238
1917	137
1918	97

The table only proves that malaria is a matter of more or less easy control, being simply a question of constant and continuous work. There has been continuous endeavor to improve the drainage conditions, eliminating all unnecessary drains, many of which have been filled and others straightened out. This has been done with no additional expense as to labor and with a very marked saving in expense in the consumption of oil.

A survey has been made recently of all ditches in what might be termed the Panama District and it totals 58,000 linear yards; this was done to correct former errors and to arrive at the exact yardage.

The serious problem confronting this office now as regards malaria is the condition of that portion of the environs of the city of Panama known as "Las Sabanas." Cases of malaria keep coming from this district and will continue to do so, so long as that section is not properly sanitated. It seems a useless expense to clean up a small section of it, and steps should be taken to have a proper sanitary survey made of this entire section, to be followed by complete sanitation.

Tuberculosis.—It is interesting to note from the following table the probable effect of the work directed from this office, regarding housing conditions in the city of Panama so far as they relate to the marked decreased mortality percentage.

Death rate from tuberculosis.

1916	5.15
1917	5.22
1918	4.14

No census was taken in 1918, and it is possible that a decrease in the population may be partly responsible for the lower number of deaths. This will be ascertained when a new census is made of the population.

There is now in contemplation another radical measure in regard to housing which it is believed will have a marked effect upon not only the death rate from tuberculosis, but upon health conditions generally in the city of Panama, and that is that each human being is entitled to at least 300 cubic feet of air space, and it is proposed to have each door opening into every room in each tenement house in this city lettered with the cubical contents thereof and confine the occupancy of each room to the required space; this can be done under the existing regulations and would have been done long ago had we had a building inspector attached to this office.

Possibly, under this heading might be shown the large decrease under the head of infant mortality. The following table for the past four years will show the practically stationary condition from 1914 to 1917, inclusive, and the marked decrease for the year 1918:

Rate per thousand infant mortality.

1914	272
1915	221
1916	236.86
1917	237.73
1918	188.27

This mortality rate, together with that from tuberculosis, could be largely decreased if the absolutely indigent members of the population were furnished with sufficient and nutritious food.

Soup kitchens established in two or possibly three sections of the city would be of great benefit, provided some scheme could be arranged so that the food did not go into unworthy hands: however, this is a matter of detail and can and should be worked out. Meat is cheap and beans are cheap, and the combination would go far toward alleviating the present conditions, provided the funds could be found.

Smallpox.—The first case of smallpox was reported on July 10; all told to December 31 there were 102 cases. It developed, however, upon investigation that there had been 2 previous cases in the city, 1 on June 6 and 1 on June 24.

It is to be expected that individual cases will appear from time to time for months to come, as the native population will hide out children, in many instances grown people, to keep them from being vaccinated; as new cases are reported the original procedure is adhered to, disinfecting the premises and vaccinating all persons within one city square from point of infection, that is those who have not been previously and successfully recently vaccinated. Under the direction of this office there have been done from July 10 to December 31, 61,621 vaccinations.

Regulation of midwives.—All midwives were reexamined in the month of December and 13 were refused licenses; as time goes on, probably 50 per cent of the present number of midwives should be refused licenses. It is difficult to take away their sole means of livelihood, especially some of them who are well advanced in age.

Dogs.—During the last few months of the year, 708 dogs were impounded and killed and the effects can be seen now upon the city streets, as but few dogs are abroad. The work is being kept up, nominally by the Alcalde, but actually by this office.

Schools.—Just as soon as the present building inspector can get to the matter, all schools within this city will be surveyed and many of them closed on account of overcrowding.

Stables.—The old question of stables in connection with fly-breeding has come up many times since the first of May and it was my earlier intention to have all stables with the exception of those of the Republic of Panama and the Panama Railroad closed, but when the owners showed their books and the large sums of money expended on buildings and yards under the direction and with the approval of a previous health officer, it did not look reasonable, but it was reasonable that they should all be required to be kept clean and we are having but little trouble now from fly-breeding as a result of filthy conditions, and it is hoped by the beginning of next rainy season there will be no fly-breeding places in the city, and by that time, sufficient fines will have been imposed to force owners, not only of stables but of hotels, restaurants, clubs, stores, etc., to recognize the fact that cleanliness is cheaper than dirt.

Manure.—All manure from the stables within the city is now being disposed of at Peña Prieta—filling in; this, while done without cost to this office, is a great waste of valuable material and some system should be devised whereby this very necessary fertilizer could be disposed of to the gardens around the city.

Examination of food handlers.—Three hundred and eighty-five butchers, cooks, waiters, and food handlers, barbers, and cigarmakers, were examined, 348 of whom were given a license to continue their work and 37 ordered to Santo Tomas Hospital for treatment.

Street cleaning.—This work has been well and efficiently done by the inspector in charge and by the men under him and it has been done in the most creditable manner, as the general condition of the streets of the city of Panama will compare favorably with that of any city of similar size anywhere.

Garbage collection and disposal.—The current year has seen the change from horse to motor conveyance of garbage at a very marked reduction in cost and increased efficiency.

Up to the 1st of December, with the exception of the period of repair at the Gavilan Island incinerator, all garbage was consumed at the incinerator. From December 1 to December 20, what might be called the Philippine method was tried out here with very marked success, both as to expediency and as to cost. This method consists of filling in low land where drainage ditches are maintained and where the cost of maintenance of these ditches would have been saved as the work progressed from month to month. The 20 days' trial of this method shows an actual cost per ton of 28.77 cents. This is the actual cost of labor and disinfectant with no overhead charges added, as the overhead after one month's trial would be practically nil as there would be no necessity for additional supervision, the foreman being amply competent to direct the work with only an occasional visit of either the health officer or one of his inspectors. The cost *per*

diem amounted to $16.40 and there was an average of 57 tons buried each day. On the 20th of December this office was directed by the Acting Governor to discontinue this method for the reason that the incinerator was built to be used and should be utilized for that purpose. Also on December 1 the management of the incinerator plant was removed from the direction of this office, under orders from the Governor's Office.

Venereal prophylaxis.—Under Decree No. 12 of the Municipality of Panama, issued on June 28, 1918, this office assumed direction of the venereal prophylaxis problem, establishing a prophylactic station on Twentieth Street and attempting to confine all prostitutes and clandestines within a given area. During the period from July 15 to November 5 there were examined at the prophylactic station 4,319 men, of which number 4,192 returned to the station for prophylactic treatment. During the same period there were registered at Santo Tomas Hospital 539 women. The following statistics on examination and treatment of prostitutes at Santo Tomás Hospital, are given:

Number of examinations, July 15 to December 31	2,694
Number of salvarsan treatments, July 15 to December 31	568
Number of mercurial injections, July 15 to December 31	178
Number of Wassermans taken, July 15 to December 31	959
Number of smears taken, July 15 to December 31	5,514
Number of admissions to hospital, July 15 to December 31	994

Of the 994 treated in the hospital, 152 were treated for syphilis and 916 for gonorrhea, 74 having been treated for both diseases.

There were reported by physicians in the city of Panama 82 cases of gonococcus infection and 25 cases of syphilis.

Colon Health Office.

General permanent improvements.—Many permanent improvements which will facilitate sanitation have been made during the year, such as the extensive hydraulic filling of the large swamps along the north side of the Fort Randolph road on which are located the Coco Solo Submarine Base and Aviation Field, and France Field; the filling and grading of the ground between Colon Hospital and the Radio Station, and the filling of the swampy area south of Fifteenth Street near Boca Grande, and the erection of a modern abattoir on same by the municipality of Colon. The large swamp north of Ninth Street and between New Cristobal and G Street is being filled at present. This will eliminate one of the largest culex breeding areas in the entire district.

The new cold storage plant at Mount Hope is almost completed. When this plant is in operation the old dilapidated rodent-infested plant now being used at Cristobal will be abandoned and old Dock No. 11 will be demolished. Old Dock 3, another rodent stronghold, is being demolished at present.

A new set of silver quarters are being erected near the quartermaster's corral on the Mount Hope road. Several large apartment houses have been erected in Colon during the year. These and the new silver quarters being erected at Mount Hope will somewhat relieve the congested conditions in Colon.

Malaria.—The malaria incidence in this district has been lower than ever before. Many times there were no cases recorded on the

weekly reports. The number of cases among employees reported for the entire year was 52. The extensive antimalarial work in and around Mount Hope and the filling of swamps near Coco Solo from which flights of mosquitoes had been coming into Colon every year, have contributed materially to the exceptionally low malarial rate. However, the outlying districts, such as Coco Solo, France Field, and Fort Sherman have suffered more from malaria than in recent years. The number of mosquitoes caught during the year was 19,043, of which 17,712 were culex.

Tuberculosis.—The number of cases of tuberculosis reported during the calendar year was 116. The congested condition of tenement houses, the discharge of uncured cases from the hospitals for lack of room and the economic status of the population in general in Colon make it a very difficult problem to deal with. The erection of a sanitarium for the isolation of all cases of tuberculosis is an urgent need and would go far in solving the problem.

Other communicable diseases reported were: Diphtheria, 8; chicken-pox, 21; pneumonia, 17; typhoid, 5; measles, 142; mumps, 9; whooping cough, 28; meningitis, 2; malaria, 41; opthalmia, 4; tetanus, 1; smallpox, 6; tuberculosis, 116.

Smallpox.—Five cases of smallpox were reported from December 1 to 31. All were in same locality and all from same focus. Twenty-three thousand people in Colon have been vaccinated during the past 3 months.

There has been no epidemic of any sort during the year. The smallpox cases originated in Panama City and as nearly every person in Colon had previously been vaccinated, there was no chance for it to become epidemic.

The typhoid cases were probably due to eating shell fish or from obscure carriers.

Street cleaning.—This work has been carried on as usual under the supervision of a sanitary inspector. Rubbish cans were placed on the principal streets during the year. This was considered a necessary sanitary improvement and the expense was covered in accordance with Article No. 7, Sanitary Regulations.

Dogs.—The number of stray and diseased dogs in Colon has been greatly reduced during the year. There were 350 dogs humanely killed by this department during the year.

Abattoir.—The antemortem, post-mortem, and quarantine inspection of animals arriving at this port and slaughtered at the abattoir has been carried on in the usual thorough manner.

Several cases of anthrax were found during the year at the abattoir, but with the present efficient force in charge of the post-mortem work, it is impossible for any anthrax-infected meat to escape their notice. Splenic smears are taken as a routine from every cow slaughtered at the abattoir and examined immediately.

Garbage disposal.—The collection and disposal of garbage has been kept up on the same lines as in previous years. Salvaging on a small scale has been attempted during the year. Grease has been salvaged by Kirkpatrick's soap factory, and rags, jute, rubber, etc., were collected by the Supply Department, and owing to shortage of potash, we have been selling ashes from the dump to the different soap manufacturers in Colon.

Venereal prophylaxis in Colon.—For the past six months the Health Department has been waging a campaign for the prevention and proper treatment of venereal diseases in Colon.

On the first examination of the prostitutes, 90 per cent of them were found with venereal infections. The last examination shows that only 2 per cent are infected at present. Two officers and eight enlisted men from the Medical Corps were placed in charge of the venereal clinic and its operations. Over one hundred doses of asphinemine were given in the clinic. Minor operations and treatment of chronic cases were also done in the clinic.

The segregated district was reduced from six square blocks to one, and a policeman was placed at each corner of said block night and day and no one could enter the district without a pass issued by the medical officer. In order to secure said pass the applicant would have to submit to an examination for the purpose of disclosing the presence or absence of venereal infections. If found infected he was given one treatment for same and instructed to report to some private physician for treatment.

The campaign in Colon has been satisfactory, and much good has been accomplished. Colon was made unprofitable for a prostitute to ply her trade in and as a result many left the country. Clandestine prostitution was reduced markedly.

Remarks.—The general sanitary conditions in the entire district are far better than ever before and with the completion of the many permanent improvements now under way, the operations of this department for the coming year will be greatly facilitated.

QUARANTINE.

The problem of protecting the Canal from imported disease remains practically the same as the preceding years for two major diseases, viz, bubonic plague and yellow fever. In addition the exclusion of cerebrospinal meningitis and influenza have required an enlargement of ordinary quarantine activities.

Plague has been reported or is suspected to exist along practically the entire west coast of South America, except the southern part of Chile. It has during the year extended along the coast northward at places, spreading into the interior and no adequate measures are being taken in the affected or threatened districts.

Certain Ecuadorean ports are frequently omitted as ports of call for larger vessels on account of unsatisfactory sanitary conditions, but there is a considerable trade from these ports carried in small schooners which must be fumigated and in some cases detained. Plague continues in Guayaquil, the mortality being high. It is possible milder cases are not reported. On the Atlantic side, plague has been present at ports of Brazil and Argentina and at Charallave, in the interior of Venezuela. It is believed cases may have occurred at Caracas.

Vessels from Chilean and Peruvian ports are inspected by an officer of the U. S. Public Health Service on duty in the office of the Consul General at Callao. Passengers from plague ports are at present detained to complete a period of seven days from date of

sailing and fumigation. However, as plague is now known to be a rat-borne disease in which the human element is negligible, it is probable that the regulations will be modified in the future so as to concentrate all efforts to exclude plague on vessels and rats carried by them. No cases of plague have been brought to the Isthmus during the year.

Yellow fever is endemic along the coast of Colombia and Ecuador with outbreaks in epidemic form from time to time. Although the disease has not been reported in Colombia during the year, all precautions taken during the epidemic of last year have been continued as a measure of safety. Vessels are fumigated at Buenaventura by an accredited officer in the Canal service and passengers from all yellow fever suspected ports are detained to cover the incubation period of six days from last possible exposure. At Guayaquil there is also an inspector of the U. S. Public Health Service who inspects all passengers destined for the Isthmus and fumigates the vessel for both rats and mosquitoes.

Yellow fever has made its appearance in Central American ports in epidemic form for the first time in several years. It was particularly prevalent in the Guatemalan ports of San Jose de Guatemala and Champerico and in the inland towns of Retalhahue and Escuintla, which are important railroad junctions as well as in the towns on the Guatemala-Mexico border. Fortunately the danger of bringing yellow fever from the Pacific ports to the north is less than that from Ecuador or Colombia, as absence of good harbors and wharves force steamers to lie well beyond the range of flight of the *Aedes calopus*. The single exception is Corinto, Nicaragua, but here vessels are allowed to use the wharf only in daytime and other precautions are taken under the supervision of the U. S. Vice-Consul.

Small sailing craft from any suspected ports are fumigated on arrival and the personnel held in quarantine.

On the Atlantic side yellow fever has been present at Brazilian ports and all Mexican, Central American, Colombian, and Venezuelan ports must be viewed with suspicion especially in the absence of reliable reports.

The steamer *Jamaica* arrived at Balboa on October 23 from Guayaquil having had one death at sea diagnosed as liver abscess. The history pointed to yellow fever contracted at Guayaquil and all precautions were taken, including refumigation of the vessel.

Smallpox has been present in the islands of San Andres and Old Providence, Colombia, and there have been some cases along the Atlantic coast of that country; it was reported as epidemic in Buenaventura. All persons coming to the Canal from Colombia are vaccinated but small trading boats do not pass quarantine and are probably responsible for the small epidemic of that disease that has occurred in the Republic of Panama.

Owing to the prevalence of influenza in both North and South American ports a strict quarantine against this disease was instituted in October. Since then the disease has not spread to any extent on the Canal Zone although cases have arrived at quarantine. On three vessels so many members of the crew were sick that they could not proceed until partial new crews were shipped.

One of the largest quarantine procedures ever attempted upon the Isthmus was the handling of the epidemic of cerebrospinal menin-

gitis upon the Japanese steamer *Anyo Maru*, which was turned back from Callao. This ship was received at Balboa, May 28, with a passenger list of 585 and a crew list of 234, having had in all 28 cases of meningitis, with 11 deaths. The entire passenger list, together with all known or suspected contacts among the crew, were immediately disembarked and removed to the Balboa Quarantine Station. The ship was thoroughly fumigated, steerage and crews' quarters washed down with live steam, followed by bichloride, and allowed to proceed after cultures from all members of crew were reported negative.

Space at the quarantine station not being sufficient, the adjacent Yacht Club, the Mañana Club, and the Chinese detention barracks were used. A small hospital for the care of the active cases was established.

The temperatures of all patients were taken twice daily, and all throats were sprayed morning and evening with a 5 per cent solution of dichloramine-T. From 150 to 200 cultures were taken daily, thus insuring that each patient had at least one culture every three days. As soon as a positive culture was obtained the patient was at once isolated in tents and maintained there until three negative cultures were obtained, or developed active meningitis, in which case he would be transferred to the hospital. Happily no cases developed during the entire time of quarantine. Patients isolated with positive cultures were cultured daily, and given a spray every three hours.

The sanitary situation was handled by a gang of 24 Japanese laborers. This gang attended to the grounds and the cleaning of the building. They were recruited from among the steerage passengers.

A small dispensary was established to attend the minor complaints of the passengers. This was opened one hour daily and had an average of 80 patients daily.

The difficulty of the situation was enhanced by the fact that over 95 per cent of the patients were Asiatics, and there was a lack of interpreters. A strict isolation was maintained from the beginning, insuring against the spread of the disease outside of the quarantine grounds.

With the exception of the cases of smallpox already mentioned in this report, no maritime quarantinable disease arrived at Zone ports or occurred on the Isthmus during the year.

CONCLUSION.

The Health Department of The Panama Canal is a model of its kind, entirely devoid of politics. One hundred per cent of the time of all of its employees is given to health work. As a result the Canal Zone is probably the healthiest section of the world to-day. In the cities of Panama and Colon, violations of the sanitary regulations are punished by a fine or imprisonment by the health officer. The certainty of punishment makes resort to this power rarely necessary. It seems a pity that the great lesson of the sanitation of the Canal can not be carried to every home in America that the favorable results secured in this pesthole might be obtained at the very much smaller purchase price it would cost in our more favored climate.

ADMISSION RATE PER 1,000 EMPLOYEES.

ALL CAUSES.

Year.	Average Employees.	Rate.
1906	26547	1779
1907	39238	1419
1908	43890	1152
1909	47167	887
1910	50802	905
1911	48876	896
1912	50893	727
1913	56654	519
1914	44329	420
1915	43785	320
1916	33176	283
1917	32589	357
1918	25520	406

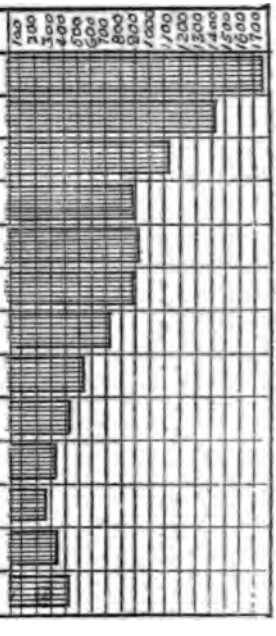


CHART I.

DEATH RATE PER 1,000 EMPLOYEES.

ALL CAUSES.

Year.	Average Employees.	Rate.
1906	26547	41.73
1907	39238	28.74
1908	43890	13.01
1909	47167	10.64
1910	50802	10.98
1911	48876	11.02
1912	50893	9.18
1913	56654	8.35
1914	44329	7.04
1915	34785	5.77
1916	33176	6.03
1917	32589	7.09
1918	25520	8.11

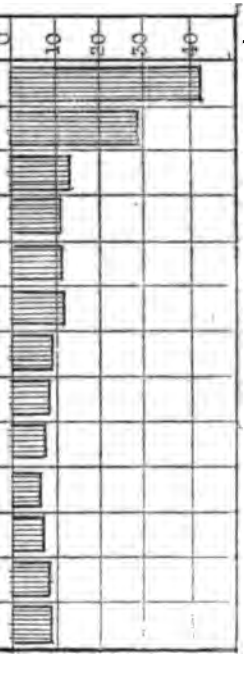


CHART 2.

NONEFFECTIVE RATE PER 1,000 EMPLOYEES.

Year	Average Employees.	Rate.
1906	26547	28.48
1907	39238	25.09
1908	43890	22.31
1909	47167	21.93
1910	50802	24.37
1911	48876	24.46
1912	50893	21.11
1913	56654	15.97
1914	44329	12.22
1915	34785	10.28
1916	33176	9.20
1917	32589	9.65
1918	25520	11.19

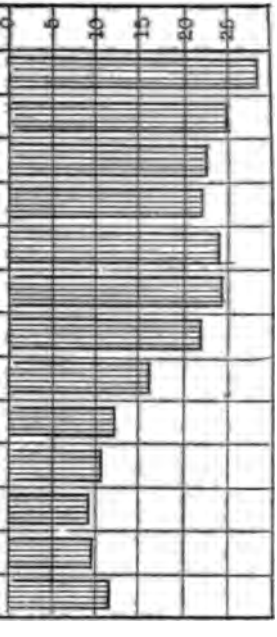


CHART 3.

MALARIAL FEVER

ADMISSION RATE PER 1,000 EMPLOYEES.

Year.	Admission Employees.	Rate.
1904	6213	125
1905	16511	514
1906	26547	821
1907	39238	424
1908	43890	282
1909	47167	215
1910	50802	187
1911	48876	184
1912	50893	110
1913	56654	76
1914	44329	82
1915	34785	51
1916	33176	16
1917	32589	14
1918	25520	18

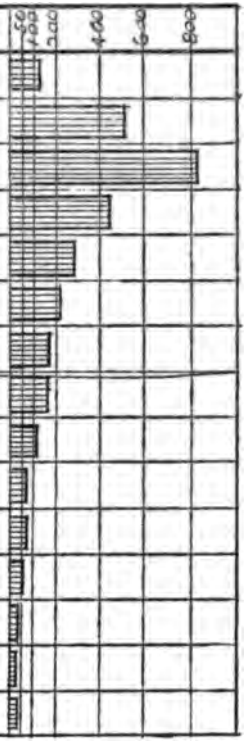


CHART 4

MALARIAL FEVER.

DEATH RATE PER 1,000 EMPLOYEES.

Year.	Average Employees.	Rate.
1904	6215	2.66
1905	16511	5.57
1906	26547	7.45
1907	39236	3.51
1908	43990	1.37
1909	47167	.85
1910	50802	.81
1911	48878	.54
1912	50893	.31
1913	56654	.30
1914	44529	.14
1915	34765	.23
1916	33176	.06
1917	32589	.09
1918	25520	.08

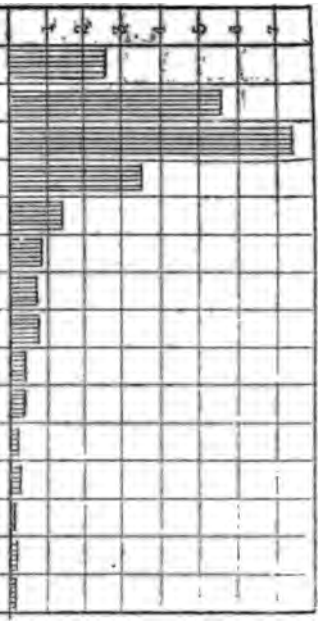


CHART 5

MALARIAL FEVER.

DEATH RATE PER 1,000 POPULATION IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

EMPLOYEES AND NONEMPLOYEES.

Year.	Population.	Rate.
1906	73264	8.49
1907	102133	5.57
1908	120097	3.36
1909	135180	2.07
1910	151691	1.89
1911	156938	1.82
1912	146510	1.84
1913	129104	1.32
1914	123592	1.27
1915	121650	.81
1916	116918	.21
1917	114003	.18
1918	109737	.11

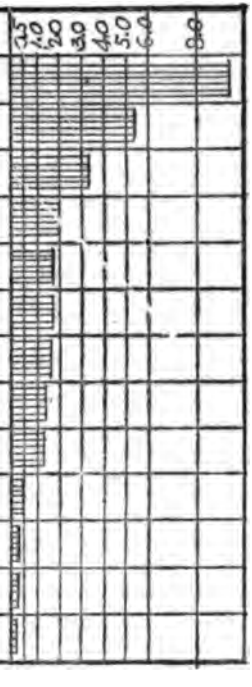


CHART 6

TABLE 1.—DISCHARGES, DEATHS, AND NONEFFECTIVE RATES FOR EMPLOYEES.

ABSOLUTE NUMBERS.

	Number of employees.	Discharges and deaths from hospitals.			Deaths.			Noneffective from sickness.	
		Total.	Disease.	External causes.	Total.	Disease.	External causes.	Days treated.	Constantly noneffective.
Year, 1918:									
White	4,408	1,216	1,049	167	17	16	1	26,821	74.50
Colored	21,112	2,948	2,437	511	190	166	24	75,784	210.51
Total	25,520	4,164	3,486	678	207	182	25	102,605	285.01
Year, 1917:									
White	4,814	1,551	1,348	203	32	22	10	31,132	85.29
Colored	27,775	3,691	2,719	972	199	165	34	83,648	229.17
Total	32,589	5,242	4,067	117.5	231	187	44	114,780	314.46

PROPORTIONATE NUMBERS.[1]

Year, 1918:									
White	4,408	275.86	237.98	37.88	3.86	3.63	0.23	.....	16.88
Colored	21,112	139.64	115.43	24.21	9.00	7.86	1.14	.....	10.00
Total	25,520	163.17	136.60	26.57	8.11	7.13	.98	.....	11.19
Year, 1917:									
White	4,814	322.18	280.02	42.17	6.65	4.57	2.08	.....	17.92
Colored	27,775	132.89	97.89	35.00	7.16	5.94	1.22	.....	8.25
Total	32,589	160.85	124.80	36.05	7.09	5.74	1.35	.....	9.65

[1] Annual average per 1,000 employees.

TABLE II.—CAUSES OF DEATHS OF EMPLOYEES ARRANGED WITH REF-

Causes of death.	Color.		Age in years.				
	W.	B.	15-20	21-25	26-30	31-35	36-40
Abscess of liver		1			1		
Apoplexy	1	5					1
Arteriosclerosis		1					
Aneurysm		3				1	
Ankylostomiasis		1		1			
Cancer	1	5		1			2
Circulatory system, other diseases		2				1	
Diabetes	1	1					
Dysentery		1					
Endocarditis		1			1		
Gangrene, testicle and cord		1					1
Gastritis, acute		1				1	
Heart, organic disease	3	13		1	1	3	2
Intestinal obstruction		2				1	
Influenza		1					1
Intestines, other diseases of		1			1		
Ill-defined		1					
Leuchaemia		1			1		
Liver, cirrhosis of		4					1
Malaria		2				1	1
Meningitis, simple	1	5		1	2		
Meningitis, pneumococcus	1	2	2		1		
Meningitis, cerebro-spinal		1					1
Nephritis, acute		4		2		1	
Nephritis, chronic	1	14			8	2	3
Pneumonia, broncho	1	4		1	1	1	1
Pneumonia, lobar		28	2	4	9	2	5
Pott's disease		1					
Pyemia		1					
Pulmonary edema		1				1	
Pachymeningitis syphilitic		1					1
Pyelitis		1					1
Peritonitis		1					1
Paralysis, general	1						
Pulmonary congestion	1						
Riggs disease		1					1
Septicemia	1	4	1	1			1
Syphilis		3					2
Stomach, ulcer of		1					
Tuberculosis, pulmonary	3	41	2	10	16	5	6
Tuberculosis, disseminated		2				1	1
Tetanus		1					1
Undetermined		1	1				
External causes.							
Drowning, accidental	1	4	1			2	2
Traumatism, dynamite		1					
Traumatism by crushing		5		1	2	1	
Traumatism by fall		1		1			
Traumatism, railroad		4	1		2	1	
Poisoning, other acute		1			1		
Suicide, poisoning		1			1		
Suicides, other		1				1	
Other external violence		6	1		3	1	1
Total	17	190	11	24	46	27	39

'O COLOR, AGE AND LENGTH OF RESIDENCE ON ISTHMUS.

ears—Con.			Length of residence on Isthmus (in years).															
55–65	66–80	Unknown	Under 1	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–10	10–12	12–15	Over 15	Life	Unknown	Total.
													1				1
1		1									1	1	3			2	6
											1						1
		1				1					1	1	1				3
																	1
1									2		1		1	1		1	6
																2	2
		1			1			1									2
	1															1	2
											1						1
																1	1
																1	1
2			1				1	2		1	2	3	1	3		3	16
													1				2
													1				1
			1														1
										1				1			1
						1				1					2		4
									1	1	1	2		1		1	6
						1						1			2		3
							1		1			1				1	4
								1			3	5	2			4	15
		1	1							1	2		1				5
2		1				1	5	1		2	3	5	3	1	4	3	28
											1						1
													1				1
															1		1
													1				1
																1	1
																1	1
													1				1
																1	1
			1														1
			1					1			2	1					5
	1					1						1				1	3
													1				1
			3	1	2		3	5	3	3	6	7	5		1	5	44
								1					1				2
										1							1
					1												1
											1					4	5
											1						1
							2		1	1	1						5
							1										1
			1							1	1		1				4
																1	1
																1	1
											1						1
				1				1	1						1	2	6
6	2	5	9	2	4	5	13	13	9	13	29	29	26	7	11	37	207

TABLE III.—DEATHS OF RESIDENTS OF THE CITIES OF PANAMA, COLON, AND THE CANAL ZONE.

Place.	Average population.	Deaths.			Annual rate per 1,000 population.		
		Total.	Disease.	External causes.	Total.	Disease.	External causes.
Year, 1918:							
Panama	61,369	1,314	1,264	30	21.41	20.92	0.49
Colon	26,078	616	587	29	23.62	22.51	1.11
Canal Zone	*22,290	236	216	20	10.59	9.69	.90
Total	109,737	2,166	2,067	79	19.74	19.02	.72
Year, 1917:							
Panama	61,074	1,714	1,661	53	28.06	27.19	.87
Colon	25,386	667	642	25	26.27	25.29	.98
Canal Zone	*27,543	313	273	40	11.36	9.91	1.45
Total	114,003	2,694	2,576	118	23.63	22.60	1.03

*Exclusive of military population.

TABLE IV.—DEATHS OF CIVIL POPULATION (EMPLOYEES PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1-4	5-10	11-20
General diseases.									
Relapsing fever	....	1	....	1	....	....	....	....	....
Malaria	2	2	3	1	....	....	2	....	1
Malarial fever:									
Estivoautumnal	8	1	2	7	....	1	1	1	....
Tertian	....	3	....	3	....	....	3	....	....
Cachexia	1	1	....	2	....	1	....	....	....
Measles	....	2	....	2	....	1	....	1	....
Whooping cough	1	1	....	2	....	1	1	....	....
Diphtheria and croup	1	5	....	6	....	2	3	....	....
Influenza	5	5	3	6	1	3	2	....	....
Dysentery	1	....	....	1	....	....	....	....	....
Dysentery:									
Entamebic	4	....	....	3	1	....	....	1	....
Unclassified	1	1	....	2	....	1	....	....	....
Leprosy	3	2	1	4	....	....	....	....	....
Purulent infection and septicemia	4	....	....	4	....	2	....	....	1
Pyemia	2	....	....	2	....	....	....	....	....
Septicemia	5	3	3	5	....	1	2	....	....
Pyemia and septicemia, pneumococcic	1	....	....	1	....	....	....	....	....
Tetanus	4	1	....	5	....	2	....	....	....
Pellagra	....	10	....	10	....	....	....	....	1
Beriberi	1	....	....	1	....	1	....	....	....
Tuberculosis of the lungs	230	131	21	324	16	3	5	....	27
Acute miliary tuberculosis	6	5	....	10	1	3	....	....	....
Tuberculous meningitis	6	6	2	10	....	6	5	1	....
Abdominal tuberculosis	4	....	1	3	....	2	....	....	1
Pott's disease	1	1	....	2	....	....	....	....	1
Tuberculosis of other organs	1	2	....	3	....	1	1	....	1
Disseminated tuberculosis	11	7	....	17	1	4	5	1	....
Rickets	....	1	....	1	....	1	....	....	....
Syphilis:									
Primary	4	2	2	4	....	2	....	1	....
Tertiary	7	1	1	6	1	....	....	....	....
Hereditary	1	3	1	3	....	4	....	....	....
Period not stated	4	....	....	3	1	2	....	1	....
Gonococcus infection	1	1	....	2	....	....	....	....	....
Adenitis chancroidea	....	1	....	1	....	....	....	....	1
Cancer and other malignant tumors of the stomach and liver	4	6	....	10	....	....	....	....	....
Cancer and other malignant tumors of the peritoneum, intestines, rectum	....	1	....	1	....	....	1	....	....
Cancer and other malignant tumors of the female genital organs	....	15	....	15	....	....	....	....	....
Cancer and other malignant tumors of the skin	....	1	....	1	....	....	....	....	....
Cancer and other malignant tumors of other organs and of organs not specified	9	6	....	15	....	....	....	1	....
Other tumors (tumors of the female genital organs excepted)	1	....	1	....	....	....	1	....	....
Chronic rheumatism and gout	1	....	....	1	....	....	....	....	....
Arthritis deformans	....	1	....	1	....	....	....	....	....
Scurvy	....	1	....	1	....	....	1	....	....
Diabetes	2	3	2	3	....	....	....	....	....
Leukemia	1	1	....	2	....	1	....	....	1
Leukemia, lymphatic	1	....	....	1	....	....	....	....	....
Anemia, primary, pernicious	....	2	1	1	....	....	....	....	....
Anemia, secondary, cause not determined	1	....	....	1	....	....	....	....	....
Other general diseases	3	....	....	3	....	....	....	....	....

ND NONEMPLOYEES), BY CAUSE, SEX, COLOR, AGE AND ESIDENCE.

Age (in years)—Continued.							Place of residence.			
21–30	31–40	41–50	51–60	61–75	76–100	Age unknown.	Panama.	Colon.	Canal Zone.	Total.
	1						1			1
		1					4			4
2	2	1	1				7		2	9
							2	1		3
1							1		1	2
							2			2
							1		1	2
	1						4	1	1	6
1	1		2	1			7	1	2	10
1							1			1
	1	1		1			2	1	1	4
		1						1	1	2
2	1		1		1		3		2	5
1							2	1	1	4
1			1				2			2
1	2	1		1			4	2	2	8
		1					1			1
1	1	1					3	2		5
5	2	2					6	3	1	10
							1			1
149	98	47	19	13			223	104	34	361
1	2	5					8	3		11
							8	2	2	12
1							2	2		4
		1					1	1		2
							2	1		3
3	5						10	3	5	18
							1			1
3							5	1		6
2	3	1		2			2	2	4	8
							1	2	1	4
		1					2	2		4
1	1						1	1		2
							1			1
1	3	2	4				6	4		10
									1	1
	6	4	4	1			9	3	3	15
				1			1			1
2	2	3	5	1	1		10	4	1	15
							1			1
				1			1			1
1								1		1
							1			1
		2	1		1	1	3		2	6
							1	1		2
1									1	1
	1	1					1	1		2
	1						1			1
1	1			1			3			5

TABLE IV.—DEATHS OF CIVIL POPULATION (EMPLOYEES AND RESIDENCE—

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
General diseases.—Continued.									
Alcoholism (acute or chronic)	2	....	....	2	....	....	....	....	....
Alcoholism chronic	2	1	....	3	....	....	1	....	....
Diseases of the nervous system and of the organs of special sense.									
Encephalitis	1	....	....	1	....	....	....	....	....
Simple meningitis	11	7	2	15	1	3	6	....	1
Cerebro-spinal fever	5	2	1	6	....	1	1	3	....
Pneumococcus meningitis	3	3	....	5	1	2	....	....	3
Other diseases of the spinal cord	2	....	....	2	....	....	1	....	....
Cerebral hemorrhage, apoplexy	21	22	6	37	....	2	....	....	....
Softening of the brain	3	....	....	3	....	....	....	....	....
Paralysis without specified cause	1	1	....	2	....	....	....	....	....
General paralysis of the insane	2	....	1	1	....	....	....	....	....
Other forms of mental alienation	....	2	....	2	....	....	....	....	....
Dementia precox	2	....	....	2	....	....	....	....	....
Epilepsy	1	1	....	2	....	1	....	....	....
Convulsions (nonpuerperal) [5 years and over]	....	1	....	1	....	....	....	....	1
Convulsions of infants [under 5 years of age]	2	3	....	4	1	4	1	....	....
Chorea	....	1	....	1	....	1	....	....	....
Other diseases of the nervous system	1	....	....	1	....	....	....	....	....
Tumor of the brain	1	1	....	2	....	....	....	....	....
Diseases of the eyes and their annexa	....	1	....	1	....	1	....	....	....
Diseases of the circulatory system.									
Pericarditis	3	2	....	5	....	....	....	....	1
Acute endocarditis	12	8	2	18	....	3	3	2	....
Malignant endocarditis	....	2	....	2	....	....	....	....	1
Organic disease of the heart	78	39	12	100	5	1	1	1	2
Angina pectoris	2	4	1	5	....	....	....	....	....
Diseases of the arteries, atheroma, aneurysm, etc.	3	....	1	2	....	....	....	....	....
Aneurysm	5	2	2	5	....	....	....	....	....
Arteriosclerosis	14	11	3	22	....	....	....	....	....
Embolism and thrombosis	2	1	....	3	....	....	....	....	....
Diseases of the lymphatic system (lymphangitis, etc)	1	2	....	2	1	1	2	....	....
Hemorrhage; other diseases of the circulatory system	4	4	1	7	....	1	....	....	....
Diseases of the respiratory system.									
Acute bronchitis	36	30	1	63	2	48	15	2	....
Chronic bronchitis	9	15	....	21	3	13	6	....	....
Broncho-pneumonia	78	60	9	127	2	67	36	4	6
Pneumonia, unqualified	9	16	5	18	2	5	3	2	2

ONEMPLOYEES), BY CAUSE, SEX, COLOR, AGE, AND PLACE OF
ontinued.

Age (in years)—Continued.							Place of residence.			
21-30	31-40	41-50	51-60	61-75	76-100	Ages unknown	Panama.	Colon.	Canal Zone.	Total
.....	.....	2	.....	.....	.....	.....	1	1	.....	2
.....	1	1	.....	.....	.....	.....	1	2	.....	3
		1	.....	.....	.....	.....	1	.....	.....	1
3	3	1	1	.....	.....	.....	12	6	.....	18
.....	2	.....	.....	.....	.....	.....	6	1	.....	7
.....	.....	1	.....	.....	.....	.....	4	1	1	6
1	.....	.....	.....	.....	.....	.....	2	.....	.....	2
5	9	10	7	8	1	1	27	10	6	43
.....	2	.....	.....	1	.....	.....	2	1	.....	3
.....	.....	1	.....	.....	1	.....	2	.....	.....	2
1	.....	1	.....	.....	.....	.....	.....	.....	2	2
1	.....	.....	.....	.....	1	.....	2	.....	.....	2
1	1	.....	.....	.....	.....	.....	2	.....	.....	2
.....	.....	1	.....	.....	.....	.....	1	1	.....	2
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	3	1	1	5
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
.....	.....	1	.....	.....	.....	.....	1	.....	.....	1
1	.....	.....	1	.....	.....	.....	2	.....	.....	2
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1
1	1	1	.....	.....	.....	1	4	1	.....	5
3	4	3	2	.....	.....	.....	17	2	1	20
.....	1	.....	.....	.....	.....	.....	2	.....	.....	2
17	30	28	17	16	4	.....	63	41	13	117
2	1	1	1	.....	1	.....	4	2	.....	6
.....	.....	3	.....	.....	.....	.....	.....	3	.....	3
.....	4	2	.....	.....	.....	1	1	6	.....	7
.....	1	6	7	8	3	.....	14	5	6	25
.....	1	1	1	.....	.....	.....	3	.....	.....	3
.....	.....	.....	.....	.....	.....	.....	2	1	.....	3
2	3	1	1	.....	.....	.....	6	1	1	8
1	.....	.....	.....	.....	.....	.....	34	32	.....	66
.....	1	2	1	1	.....	.....	4	19	1	24
6	9	3	1	5	1	.....	86	41	11	138
5	6	1	.....	1	.....	.....	17	5	3	25

TABLE IV.—DEATHS OF CIVIL POPULATION (EMPLOYEES AND RESIDENCE—

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
Diseases of the respiratory system. Continued.									
Lobar pneumonia	70	33	6	97	....	8	8	1	3
Pleurisy	4	....	....	4	....	....	....	....	....
Empyema	3	....	1	2	....	....	....	1	....
Pulmonary congestion, pulmonary apoplexy	3	4	1	6	....	1	....	....	....
Gangrene of the lungs	2	1	....	2	1	....	....	....	....
Asthma	1	3	....	4	....	....	2	....	....
Pulmonary emphysema	....	3	1	2	....	....	....	....	....
Other diseases of the respiratory system (tuberculosis excepted)	3	1	1	3	....	1	1	....	....
Abscess of lungs	1	....	1	....	....	....	....	....	....
Diseases of the digestive system.									
Diseases of the mouth and annexa	1	....	....	1	....	....	....	....	....
Diseases of the pharynx	1	....	....	1	....	1	....	....	....
Stricture of the esophagus	1	....	....	1	....	....	1	....	....
Ulcer of the stomach	2	2	1	3	....	....	....	....	1
Other diseases of the stomach (cancer excepted)	4	1	....	5	....	2	....	....	....
Acute gastritis	5	6	5	6	....	8	1	....	....
Acute indigestion	4	4	1	7	....	7	1	....	....
Diarrhea and enteritis (under 2 years)	97	90	19	167	1	145	42	....	....
Colitis	20	15	....	35	....	23	9	....	....
Diarrhea and enteritis (2 years and over)	7	5	2	10	....	....	4	3	....
Colitis	2	1	....	3	....	....	2	....	....
Ankylostomiasis	2	....	....	2	....	....	....	....	1
Appendicitis and typhlitis	1	....	1	....	....	....	....	....	1
Acute appendicitis	1	1	....	2	....	....	....	....	....
Chronic appendicitis	....	1	....	1	....	....	....	....	....
Hernia, intestinal obstructions	3	4	....	7	....	1	....	....	....
Intestinal obstructions	5	....	....	5	....	1	....	....	....
Other diseases of the intestines	1	....	....	1	....	....	....	....	....
Duodenal ulcer	1	....	....	1	....	....	....	....	....
Hydatid tumor of the liver	1	....	....	1	....	....	....	....	....
Cirrhosis of the liver	17	6	2	18	3	....	....	....	....
Other diseases of the liver	5	8	....	13	....	7	1	1	....
Abscess of liver (unqualified)	8	....	3	5	....	1	....	....	1
Cholecystitis	2	1	....	3	....	....	....	....	1
Simple peritonitis (nonpuerperal)	12	10	....	22	....	....	1	....	3
Other diseases of the digestive system (cancer and tuberculosis excepted)	....	1	....	1	....	....	....	....	....
Nonvenereal diseases of the genito-urinary system and annexa									
Acute nephritis	20	15	4	31	....	6	3	2	1
Bright's disease (chronic nephritis)	76	37	11	99	3	2	2	....	2
Other diseases of the kidney and annexa	4	2	1	5	....	1	....	....	....
Bilharziasis of urinary tract	....	1	....	1	....	....	1	....	....
Pyelo-nephrosis	4	1	....	5	....	2	1	....	....
Diseases of the bladder	1	....	1	....	....	....	....	....	....
Cystitis	1	1	1	1	....	....	....	....	....

NONEMPLOYEES), BY CAUSE, SEX, COLOR, AGE, AND PLACE OF
Continued.

Age (in years)—Continued.							Place of residence.			Total
21–30	31–40	41–50	51–60	61–75	75–100	Age unknown.	Panama.	Colon.	Canal Zone.	
37	23	9	5	1		1	43	45	15	103
2		2					3		1	4
1		1					3			3
	2	2	2				5	1	1	7
1	1	1					2	1		3
				2			4			4
	2	1					2	1		3
	1	1					4			4
				1			1			1
	1								1	1
							1			1
		3					1	3		4
2	1						5			5
	1	1					10		1	11
								6	2	8
							128	47	12	187
1			1		1		28	4	3	35
2	1	1	1				8	3	1	12
				1			1		2	3
1								1	1	2
							1			1
1	1						1	1		2
				1			1			1
	1	1	3	1			5	2		7
1	2		1				3	2		5
1									1	1
				1				1		1
		1					1			1
2	4	12	4	1			17	4	2	23
	3	1					11	2		13
2	1	2		1			6	1	1	8
1			1				3			3
5	12	1					10	10	2	22
		1						1		1
	5	6	1	3			18	13	4	35
17	26	27	13	16	5	3	72	32	9	113
	2	2					5		1	6
							1			1
		1	1				2	1	2	5
		1					1			1
		1					2			2

TABLE IV.—DEATHS OF CIVIL POPULATION (EMPLOYEES AND RESIDENCE—

Cause of death	Sex.		Color			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
Nonvenereal diseases of the genito-urinary system and annexa—Continued.									
Hypertrophy of prostate	1	....	1	....	....	....	....	....	....
Uterine hemorrhage (nonpuerperal)	....	1	....	1	....	....	....	....	....
Uterine tumor (noncancerous)	....	1	....	1	....	....	....	....	....
Other diseases of the uterus	....	1	....	1	....	....	....	....	....
Nonpuerperal diseases of the breast (cancer excepted)	....	1	....	1	....	....	....	....	....
Benign tumor of breast	....	1	....	1	....	....	....	....	....
The puerperal state.									
Hyperemesis gravidarum	....	3	....	3	....	....	....	....	1
Puerperal hemorrhage	....	5	....	6	....	....	....	....	....
Puerperal septicemia	....	8	1	7	....	....	....	....	1
Puerperal albuminuria and convulsions	....	1	....	1	....	....	....	....	1
Eclampsia	....	3	....	3	....	....	....	....	....
Puerperal insanity	....	1	1	....	....	....	....	....	....
Diseases of the skin and of the cellular tissue.									
Gangrene	3	....	....	3	....	....	....	....	....
Carbuncle	....	1	....	1	....	1	....	....	....
Pemphigus contagiosus	....	1	....	1	....	1	....	....	....
Diseases of the bones and of the organs of locomotion.									
Diseases of the bones (tuberculosis excepted)	1	....	....	1	....	....	....	....	....
Caries (nontuberculous)	....	1	....	1	....	....	1	....	....
Arthritis	1	....	....	1	....	....	....	....	....
Malformations.									
Congenital malformations (stillbirth not included)	7	2	1	8	....	9	....	....	....
Diseases of early infancy.									
Newborn child	3	2	....	5	....	5	....	....	....
Congenital debility, icterus, and scleroma	7	9	1	15	....	16	....	....	....
Premature birth	24	22	6	39	1	46	....	....	....
Congenital debility	17	13	2	28	....	29	1	....	....
Atrophy of infants	....	1	....	1	....	1	....	....	....
Malnutrition	46	37	....	83	....	70	12	....	1
Other causes peculiar to early infancy (including various consequences of labor)	16	6	4	18	....	14	8	....	....
Old age.									
Senility	4	14	3	15	....	....	....	....	....

UNEMPLOYERS) BY CAUSE, SEX, COLOR, AGE, AND PLACE OF
ntinued.

Age (in years)—Continued.							Place of residence.			
21–30	31–40	41–50	51–60	61–75	76–100	Age unknown	Panama.	Colon.	Canal Zone.	Total
				1			1			1
1							1			1
1								1		1
1									1	1
	1								1	1
1							1			1
2							2	1		3
3	2						3	1	1	5
4	2	1					5	2	1	8
							1			1
3							2		1	3
1							1			1
	1	2						2	1	3
							1			1
							1			1
	1								1	1
									1	1
	1						1			1
							7	2		9
							4		1	5
							11	4	1	16
							27	13	6	46
							21	7	2	30
								1		1
							48	17	18	83
							14	8		22
			1	4	13		17		1	18

TABLE IV.—DEATHS OF CIVIL POPULATION (EMPLOYEES AND RESIDENCE.

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1-4	5-10	11-20
Affections produced by external causes.									
Suicide by poisoning	2	1	2	1	....	....	....	....	1
Suicide by hanging or strangulation	2	....	....	1	1	....	....	....	1
Suicide by firearms	2	....	1	1	....	....	....	....	....
Suicide by cutting or piercing instruments	1	....	....	1	....	....	....	....	....
Suicide by jumping from high place	1	....	....	1	....	....	....	....	....
Other suicides	1	....	....	1	....	....	....	....	....
Other acute poisonings	1	1	1	1	....	....	....	....	1
Conflagration	....	1	....	1	....	1	....	....	....
Burns (conflagration excepted)	....	2	1	1	....	1	1	....	....
Accidental drowning	8	1	2	7	....	....	1	....	1
Traumatism by firearms	3	....	....	3	....	....	....	....	1
Traumatism by cutting or piercing instruments	2	....	....	2	....	....	....	....	....
Traumatism by fall	9	1	1	9	....	....	3	....	....
Traumatism by machines	1	....	....	1	....	....	....	....	1
Traumatism by other crushings, (vehicles, railroads, landslides, etc.)	7	2	....	9	....	....	1	....	1
Railroad traumatism	4	1	....	5	....	....	....	1	1
Dynamite traumatism	1	....	....	1	....	....	....	....	....
Traumatism by landslides	1	....	....	1	....	....	....	....	....
Lightning	1	....	....	1	....	....	....	....	....
Homicide by firearms	5	....	1	4	....	....	....	....	2
Homicide by cutting or piercing instruments	1	2	....	3	....	....	....	....	1
Homicide by other means	....	1	....	1	....	....	....	....	....
Fractures (cause not specified)	3	2	1	3	1	....	1	....	1
Dislocations	2	....	....	2	....	....	....	....	1
Other external violence	5	1	....	6	....	1	....	....	....
Ill-defined diseases.									
Sudden death	....	1	....	....	1	....	....	....	....
Cause of death not specified or ill-defined	12	14	2	22	....	8	6	4	1
Infections of undetermined origin	2	1	....	3	....	1	1	....	....
No disease	1	....	....	1	....	....	....	....	1
Total	1263	903	186	1928	52	620	225	35	87
Stillbirths	142	133	33	238	4	....	....	....	....
Grand total	1405	1036	219	2166	56	620	225	35	87

NONEMPLOYEES—BY CAUSE, SEX, COLOR, AGE, AND PLACE OF—Continued

Age (in years)—Continued.							Place of residence.			
21–30	31–40	41–50	51–60	61–75	76–100	Age unknown	Panama.	Colon.	Canal Zone.	Total.
	2						1		2	3
	1						2			2
	1	1					2			2
1									1	1
	1							1		1
	1								1	1
1							1	1		2
									1	1
							1		1	2
2	5						1	4	4	9
1	1							3		3
1	1						1		1	2
3	3		1				1	9		10
								1		1
5	1			1			3	4	2	9
1	2						1	1	3	5
		1					1			1
		1					1			1
	1						1			1
	2	1					5			5
1	1						1	2		3
	1								1	1
1	1		1				4	1		5
1							2			2
3	2						1	2	3	6
					1		1			1
2	2	1	2				17	8	1	28
	1						1	2		3
									1	1
358	349	235	115	99	34	9	1314	616	236	2166
							164	66	45	275
358	349	235	115	99	34	9	1478	682	281	2441

TABLE IV-A.—DEATHS

Cause of death.	Sex.		Color.		Under 1 year.
	M.	F.	W.	B.	
Influenza	5		4	1	
Chronic nephritis	7	4	2	9	
Other diseases of the kidney	1			1	
Stricture of the urethra	1		1		
Pulmonary tuberculosis	21	5	4	22	
Disseminated tuberculosis	2	1	1	2	
Cerebrospinal meningitis		1		1	
Tuberculous meningitis	1			1	
Arteriosclerosis	3	2	1	4	
Organic disease of the heart	14	4	3	15	
Diarrhea and enteritis	4			4	
Broncho-pneumonia	10	3	3	10	
Pneumonia, unqualified	3		1	2	
Lobar pneumonia	22	3	11	14	1
Diseases of the spleen	1	1		2	
Cancer of the female genital organs		2	1	1	
Cancer of other organs	6	1	3	4	
Homicide by firearms	3	1	3	1	
Traumatism by fall	1			1	
Epilepsy	1	2		3	
Colitis	1			1	
Peritonitis	1	1	1	1	
Locomotor ataxia	1		1		
General paralysis of the insane	1			1	
Pulmonary edema	1			1	1
Malaria fever	3		2	1	
Intestinal obstruction	1		1		
Diseases of the respiratory system	1			1	
Fracture, cause not specified	1		1		
Malnutrition		1		1	1
Diseases of the intestines	1			1	
Phlegmon and cellulitis	1			1	
Syphilis, period not stated	3			3	
Dysentery	3		1	2	
Purulent infection, septicemia	2			2	
Tetanus	1			1	
Aneurysm	1		1		
Acute bronchitis		2		2	1
Acute appendicitis	1	1	1	1	
Abscess of the liver	1			1	
Abscess of the liver (entameba)	1		1		
Cirrhosis of the liver	2	1	1	2	
Absorption of deleterious gases	1			1	
Premature birth	1			1	1
Erysipelas		1		1	1
Premature delivery		1		1	
Accidental drowning	7		2	5	
Railroad traumatism	1		1		
Embolism and thrombosis	1			1	
Septicemia	1		1		
Empyema	1		1		
Leprosy		1		1	
Gangrene of the lungs		1		1	
Conflagration	1		1		
Convulsions	1			1	
Pericarditis	1			1	
Pyemia	1		1		
Typhoid fever	1		1		

[1] Includes deaths of all nonresidents, off incoming ships, etc.
Deaths of nonresidents are not taken up in the statistical charts relating to Panama, Colon.

OF NONRESIDENTS.[1]

Age (in years).									Total
1–4	5–10	11–20	21–30	31–40	41–50	51–60	61–75	+75	
			2		3				5
			1	4	4	2			11
						1			1
							1		1
			13	5	5	2	1		26
1		1	1						3
			1						1
1									1
	1						4		5
		1	2	3	7	3	2		18
1				2		1			4
2	2	2	6					1	13
			2	1					3
		2	13	5	2	2			24
				1	1				2
					1	1			2
				2	2	1	2		12
		1	2		1				4
			1						1
		1	2						3
					1				1
			2						2
						1			1
				1					1
									1
			3						3
					1				1
			1						1
					1				1
									1
	1								1
		1	1			1			3
					2		1		3
			1	1					2
						1			1
				1					1
1									1
			2						2
			1						1
				1					1
				1	2				3
									1
									1
			1						1
			3	2	1		1		7
			1						1
				1					1
			1						1
				1					1
		1							1
			1						1
			1						1
1									1
1									1
				1					1
			1				1		2

[1] and the Canal Zone.

TABLE IV-A.—DEATHS

Cause of death.	Sex.		Color		Under 1 year
	M.	F.	W.	B.	
Ill-defined or not determined	2		2		
Apoplexy		1		1	
Gangrene	1			1	
Traumatism by firearms	1			1	
Total	156	41	55	138	6

[1]Includes deaths of all nonresidents, off incoming ships, etc.
Deaths of nonresidents are not taken up in the statistical charts relating to Panama, Colon,

OF NONRESIDENTS.—Continued.

Age (in years).									Total.
1–4	5–10	11–20	21–30	31–40	41–50	51–60	61–75	75	
		1				1			2
							1		1
					1				1
				1					1
8	4	11	67	35	35	17	13	1	197

and the Canal Zone.

TABLE V.—DEATHS BY NATIONALITY OR NATIVITY.

Nationality.	Employees.		Nonemployees.		Total.		Grand total.
	Male.	Female.	Male.	Female.	Male.	Female.	
Antigua	6		12	6	18	6	24
Austria			1		1		1
Argentina			1		1		1
Barbados	60		174	146	234	146	380
Bermuda				2		2	2
British Guiana	1		2	3	3	3	6
Bocas del Toro				1		1	1
Chile	1		3		4		4
China			39	4	39	4	43
Colombia	8		68	44	76	44	120
Costa Rica			5	3	5	3	8
Cuba			5	2	5	2	7
Curacao			1		1		1
Demerara			4	3	4	3	7
Dominica				3		3	3
Ecuador			7	3	7	3	10
England			3	1	3	1	4
Fortune Island	5		2	1	7	1	8
France			4	3	4	3	7
Germany			1		1		1
Greece			4	4	4	4	8
Grenada	8		12	10	20	10	30
Guadeloupe	3		5	6	8	6	14
Grand Cayman Island			1		1		1
Honduras			1		1		1
Haiti	2		2	1	4	1	5
Holland			1	1	1	1	2
Ireland			2	1	2	1	3
Inagua	1				1		1
India	1		1		2		2
Italy			11	2	11	2	13
Jamaica	54	1	252	228	306	229	535
Las Tablas			1		1		1
Martinique	7		38	23	45	23	68
Mexico			6	1	6	1	7
Montserrat	2		4	6	6	6	12
Nicaragua			2	2	2	2	4
Nassau			1		1		1
Nevis		1				1	1
Panama	14		277	316	291	316	607
Persia			2		2		2
Peru	2		11	7	13	7	20
Porto Rico			3	2	3	2	5
San Salvador			2		2		2
St. Kitts	1			2	1	2	3
Santa Isabel			1		1		1
St. Lucia	7		17	22	24	22	46
St. Thomas	1		1	3	2	3	5
St. Vincent's	3		9		12		12
Scotland			2		2		2
Spain	4		13	6	17	6	23
Switzerland			1		1		1
San Miguel			1		1		1
Santo Domingo				2		2	2
Trinidad	2		16	9	18	9	27
Turks Island			1		1		1
United States	11		16	14	27	14	41
Venezuela			5	4	5	4	9
Virgin Islands				1		1	1
Unknown			5	3	5	3	8
Total	204	2	1059	901	1263	903	2166

TABLE VI.—STATISTICS RE AMERICAN EMPLOYEES AND THEIR FAMILIES.

	Annual death rate per 1,000 population.
White employees from the United States:	
Disease	3.38
External causes	1.03
Total	4.40
White women and children from the United States:	
Disease	4.42
External causes	.94
Total	5.36
White employees from the United States and their families:	
Disease	4.25
External causes	.92
Total	5.17

Number of American children born on Isthmus during year 1918	221
Deaths among American children under 1 year of age	19
Infant mortality rate among American children (number of deaths per 1,000 births)	44.30

TABLE VII.—BIRTHS AND BIRTH RATES IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

	Average population.	Births.			Rate per 1,000 population.		
		Total.	Alive.	Still-born.	Total.	Alive.	Still-born.
Year, 1918:							
Panama	61,369	2,472	2,308	164	40.28	37.61	2.67
Colon	26,078	861	795	66	33.02	30.48	2.52
Canal Zone	*22,290	770	725	45	34.73	32.69	2.04
Total	109,737	4,103	3,828	275	37.39	34.88	2.51
Year, 1917:							
Panama	61,074	2,943	2,728	215	48.17	44.66	3.52
Colon	25,386	968	895	73	38.08	35.22	2.86
Canal Zone	*27,543	700	657	43	26.30	24.69	1.57
Total	114,003	4,611	4,280	331	40.54	37.63	2.91

* Exclusive of military population.

TABLE VIII.—INFANT MORTALITY RATES IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

	Average population.	Births.			Deaths among children under 1 year of age.	Death rate per 1,000 births.
		Male.	Female.	Total.		
Year, 1916:						
Panama	61,369	1,205	1,103	2,308	414	179.68
Colon	26,078	418	377	795	156	197 11
Canal Zone	22,290	353	372	725	59	83.89
Total	109,737	1,976	1,852	3,828	629	164.56
Year, 1917:						
Panama	61,074	1,418	1,354	2,772	667	240.37
Colon	25,386	446	462	908	224	246.14
Canal Zone	27,543	349	320	669	85	130.68
Total	114,003	2,213	2,136	4,349	976	224 21

TABLE IX.—DEATHS OF INFANTS BY CAUSE,

Cause of death.	Sex.		Color.		-1 week.	+1 week. -1 month.
	M.	F.	W.	B.		
Malaria fever, estivoautumnal	1	....	....	1	....	....
Pernicious malaria	1	....	....	1	....	....
Measles	....	1	....	1	....	....
Whooping cough	1	....	....	1	....	....
Diphtheria	....	2	....	2	....	1
Influenza	1	2	....	3	....	....
Dysentery	....	1	....	1	....	....
Purulent infection and septicemia	2	....	....	2	....	....
Tetanus	1	....	....	1	1	....
Beriberi	1	....	....	1	....	....
Septicemia	....	1	....	1	....	....
Tuberculosis, miliary	1	2	....	3	....	....
Tuberculous meningitis	3	3	1	5	....	....
Tuberculosis of the other organs	2	1	....	3	....	....
Disseminated tuberculosis	3	1	....	4	....	1
Pulmonary tuberculosis	3	1	....	4	....	1
Rickets	....	1	....	1	....	....
Syphilis, primary	2	1	2	1	....	....
Syphilis, hereditary	1	2	....	3	....	....
Syphilis, period not stated	2	....	....	2	2	....
Leuchæmia	....	1	....	1	1	....
Meningitis, simple	1	2	....	3	....	....
Meningitis, pneumococcic	....	2	....	2	....	....
Meningitis, cerebrospinal	1	....	1	....	....	....
Cerebral hemorrhage	....	2	....	2	1	1
Epilepsy	....	1	....	1	....	....
Convulsions of infants	2	2	....	4	2	....
Chorea	....	1	....	1	....	....
Diseases of the eyes and their annexa	....	1	....	1	1	....
Acute endocarditis	1	2	....	3	....	....
Organic heart disease	1	....	....	1	....	....
Diseases of the lymphatic system	....	1	....	1	....	....
Hemorrhage; other diseases of the circulatory system	....	1	....	1	....	....
Acute bronchitis	27	21	1	47	8	4
Chronic bronchitis	6	7	....	13	1	....
Broncho pneumonia	35	29	4	60	3	1
Lobar pneumonia	2	6	....	8	1	....
Pneumonia unqualified	2	3	....	5	2	....
Pulmonary congestion	1	....	....	1	1	....
Asthma	....	1	....	1	....	....
Other diseases of the respiratory system	1	....	....	1	1	....
Diseases of the pharynx	1	....	....	1	1	....
Acute gastritis	3	6	4	5	1	1
Acute indigestion	3	3	1	5	....	....
Other diseases of the stomach (cancer excepted)	1	....	....	1	1	....
Diarrhea and enteritis	76	66	17	125	2	7
Colitis	12	11	....	23	....	3
Intestinal obstructions, hernia	1	1	....	2	....	....
Abscess of the liver, unqualified	1	....	....	1	....	....
Other diseases of the liver	1	5	....	6	1	....
Congestion of the liver	....	1	....	1	....	....
Acute nephritis	5	2	1	6	....	....
Chronic nephritis	1	....	....	1	....	....
Pyelonephritis	2	....	....	2	....	....
Other diseases of the kidney and annexa	1	1	1	1	....	....
Carbuncle	....	1	....	1	....	....
Pemphigus	....	1	....	1	....	....
Accident of labor	....	1	....	1	1	....

SEX, COLOR, AGE, AND PLACE OF RESIDENCE.

Age (by months).												Place of residence.			
1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	Panama.	Colon.	Canal Zone.	Total.
					1								1	1
										1	1		1	1
						1					1			1
								1	1		2			2
1	2										3			3
									1				1	1
								2			2			2
												1		1
									1		1			1
			1								1			1
1			1					1			2	1		3
1				1		1	3				5	1		6
2	1										1		2	3
		1					2				2	1	1	4
		1				1			1		3	1		4
						1					1			1
2		1									2	1		3
	1			2							1	1	1	3
											1	1		2
												1		1
			1							1	3			3
				1							2			2
			1								1			1
											2			2
	1										1			1
											3		1	4
		1										1		1
												1		1
1									1	1	2	1		3
1											1			1
					1							1		1
											1			1
1	6	7		4	3		3			4	26	22		48
		1		1	1				2	1		13		13
2	10	4	5	5	5	4			9	3	47	12	5	64
			1	3			1			2	6		2	8
						1				1	5			5
											1			1
	1										1			1
													1	1
											1			1
2			1	1	1			2			9			9
2	2	1		1								4	2	6
											1			1
15	15	13	11	10	13	8	17		10	10	104	32	6	142
2	4	1	4	1	2	3		3		1	22		1	23
	2										1	1		2
													1	1
1	1								1		6			6
1											1			1
	1	2	2				1		1	1	4	1	2	7
												1		1
					2								2	2
	2											1	1	2
		1									1			1
										1	1			1
											1			1

TABLE IX.—DEATHS OF INFANTS BY CAUSE, SEX

Cause of Death	Sex.		Color		—1 week.	+1 week —1 month.
	M.	F.	W.	B.		
Congenital malformations	5	2	....	7	3	2
Newborn child	3	2	....	5	5	....
Congenital debility, icterus, and sclerema	4	3	1	6	4	3
Premature birth	21	22	5	38	41	1
Congenital debility	20	20	2	38	21	7
Atrophy of infants	....	1	....	1	....	....
Malnutrition	39	31	....	70	2	1
Other causes peculiar to early infancy	16	7	5	18	22	1
External violence	....	2	....	2	....	....
Cause not specified or ill-defined	6	2	....	8	1	....
Total	327	293	46	574	131	36

COLOR, AGE, AND PLACE OF RESIDENCE.--Continued.

Age (by months).											Place of residence.			
1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	Panama.	Colon.	Canal Zone.	Total.
1	1										5	2		7
											4		1	5
											5	1	1	7
1											26	1	6	43
	4		1	2			3	1		1	28	10	2	40
						1						1		1
8	8	3	9	4	4	3	7	3	14	4	42	12	16	70
											15	8		23
2												1	1	2
1		2						3		1	5	2	1	8
48	62	39	38	37	34	29	46	40	47	33	412	148	60	620

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS OF THE

Diseases.	Employees.											
	Discharges.						Deaths.					
	White.				Black.		White.				Black.	
	Americans.		Europeans.				Americans.		Europeans.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
General diseases.												
Typhoid fever		1			5							
Paratyphoid fever												
Relapsing fever					2							
Malaria			1									
Malarial fever:												
Estivoautumal	16	1	31		258	3					2	
Tertian	12	2	1		52	2						
Quartan	2				3							
Mixed												
Undetermined	1		5		38							
Clinical					1							
Cachexia					2							
Hemoglobinuric fever, malarial			1									
Smallpox					4	1						
Vaccinia	1											
Measles	3				19	2						
Scarlet fever												
Whooping cough												
Diphtheria and croup												
Influenza	138	28	22	1	357	5						
Miliary fever												
Dysentery	1											
Entamebic	4		1		9							
Bacillary		10	1		2							
Unclassified												
Leprosy					1							
Erysipelas	1				1							
Dengue					1							
Chickenpox					21							
German measles	1	1										
Mumps					4							
Yaws												
Filariasis					2							
Acute infectious jaundice (Weil's disease)												
Purulent infection and septicemia	2	1	2		7						3	
Pyemia											1	
Septicemia							1					
Pyemia and septicemia, pneumococcic											1	
Tetanus											1	
Actinomycosis												
Pellagra			1									
Beriberi												

PANAMA CANAL FOR THE YEAR, 1918.

Nonemployees.											Nonresidents.									
Discharges.					Deaths.						Discharges.				Deaths.					
White.			Black.		White.			Black.			White.		Black.		White.		Black.		Total discharges.	Total deaths.
Soldiers.	Others.				Soldiers.	Others.														
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.		
	1	2	2	4							2								17	1
											1								1	
	1		1																4	
3																			4	
140	24	14	36	35	3	1		2			10		1		1				569	10
75	16	10	4	5							7								186	1
1	1		1																8	
		1																	1	
32	1	3		8							2								90	
8	1	1		3						1									14	1
																			2	
																			1	
	2	3	41	53								1	12	12					126	
				1															2	
44	32	72	16	17						1	4	1	1						271	1
	1												1						2	
	3	2	2	2															9	
1	4		5	5	1					1	1								15	2
1452	92	78	49	18	6	1	1				98	1	15		1				2,385	9
1																			1	
1	1																		3	
14	5		2	1				1			7								39	1
1			1																15	
			2																2	
	1		3	1															6	
	2																		7	
2																			3	
	1	3	11	3															44	
	1	1																	4	
50	2	1	1	1							1								60	
		1	1																2	
1	1																		4	
1																			1	
5	4	2		3	2	2		2		1	3								36	10
		1									1								2	1
										1					1					3
			1																1	1
				1						1									1	2
										1									1	1
								1		3									1	4
	1		2	2				1			1								6	1

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS OF THE

Diseases.	Employees.											
	Discharges.						Deaths.					
	White.				Black.		White.				Black.	
	Americans.		Europeans.				Americans.		Europeans.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
General diseases—Continued.												
Tuberculosis of the lungs	3	1	6		28				4		30	
Acute miliary tuberculosis												
Tuberculous meningitis												
Abdominal tuberculosis					1							
Pott's disease		1			1						2	1
Tuberculosis of bones and joints	2											
Tuberculosis of other organs			1									
Tuberculosis of the skin												
Tuberculosis of the lymph glands					1					1		1
Tuberculosis of the genito-urinary organs			1		2							
Tuberculous abscess												
Disseminated tuberculosis					1						3	
Syphilis:												
Primary			2		12							
Secondary	3		1		6							
Tertiary	6	1	8		142	1					2	
Hereditary												
Period not stated					1							
Gonococcus infection					2							
Gonorrhea	8				77							
Gonorrheal arthritis					7							
Gonorrheal bubo	1				1							
Gonorrheal orchitis and epididymitis	2		2		19							
Gonorrheal ophthalmia					4							
Soft chancre	2		5		34							
Adenitis chancroidal					11							
Cancer and other malignant tumors of the buccal cavit												
Cancer and other malignant tumors of the stomach and liver	1										2	
Cancer and other malignant tumors of the peritoneum, intestines, rectum										1		
Cancer and other malignant tumors of the female genital organs						1						
Cancer and other malignant tumors of the breast												
Cancer and other malignant tumors of the skin	1				1							
Cancer and other malignant tumors of other organs and of organs not specified	1				1						2	

. CANAL FOR THE YEAR, 1918.—Continued.

Nonemployees.									Nonresidents.								Total discharges.	Total deaths.
ischarges.			Deaths.						Discharges.				Deaths.					
e			White.				Black.		White.		Black.		White.		Black.			
Others.	Black.		Soldiers.		Others.													
F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.			
4	3	20		3	1	18	26	9				1	1	2	2	112	88
	1		1		1	1	1										3
						2	2									2	3
1		3														5	
	2	1														8	3
1		1														2	
						1		1								2	1
								1								2	
2	4	3											1			10	2
	1									1						6	
						1	4									4	5
	3				1	3											7
								3								34	
		1						5								68	
3	22	45	1	1			1	25		2						355	5
	3	2														8	
2		2														32	
2	1	6														12	
	7	6						29								235	
	3	1						3								16	
	1															5	
	4	1						2								46	
	1	6														16	
1	1	3						18		2						158	
1		1						4		1						33	
								1								3	
		3						4								9	2
1		1					1	1								4	
2		4					2									7	
		3														3	
																3	
1	1	2					1	2								8	3

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.											
	Discharges.						Deaths.					
	White.				Black.		White.				Black.	
	Americans.		Europeans.				Americans.		Europeans.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
General diseases.—Continued.												
Other tumors (tumors of the female genital organs excepted)			1		4							
Acute articular rheumatism	1			1								
Chronic rheumatism and gout	2											
Arthritis deformans			1									
Scurvy	1											
Diabetes	1										1	
Exophthalmic goitre												
Leukemia lymphatic											1	
Anemia, secondary, cause not determined					1	1						
Other general diseases	5		1		3							
Purpura hemorrhagica	1											
Alcoholism (acute or chronic)	3											
Alcoholism, acute	3		1									
Alcoholism, chronic												
Alcoholic psychosis					1							
Chronic lead poisonings		1			1							
Other chronic poisonings												
Drug habit												
Simple meningitis											4	
Cerebrospinal fever		2									1	
Pneumococcus meningitis									1		3	
Locomotor ataxia	1				1							
Acute anterior polio-myelitis												
Lateral sclerosis												
Cerebral hemorrhage, apoplexy	2			1	9				1		4	
Softening of the brain												
Paralysis without specific cause												
General paralysis of the insane							1					
Other forms of mental alienation				1	5							
Dementia precox					2							
Epilepsy	3				6							
Convulsions (nonpuerperal) (5 years and over)					1							
Convulsions of infants (under 5 years of age												
Chorea												
Hysteria		1										
Neuralgia	2				1							
Neuritis	8	1		2	8							
Other diseases of the nervous system	4	1			5							
Neurasthenia	11	4			6				1			

THE PANAMA CANAL FOR THE YEAR, 1918.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.				Deaths.						Discharges.				Deaths.					
White.		Black.		White.			Black.			White.		Black.		White.		Black.			
Others.				Soldiers.		Others.													
M.	F.	M.	F.	M.	M.	F.	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.		
1		1	1							1								17	
	1	1													a			5	
1	1									1								5	
																		1	
																		1	
2	3		2					1										8	2
	2		1															3	
																			1
			3							1	1							8	
5	6		1							2		1						32	
																		1	
4										1								15	
2		1								6								28	
1		1	1															7	
1		2								1								7	
																		2	
1																		1	
1																		1	
																			4
1						2				3	1							10	3
									2										6
2	1																	5	
1		1																2	
										1								1	
		1	3	1			3	1		1								17	10
1																		1	
3	1		1															8	
		1	1				1											3	2
7	4	6	7					1		7		2						61	1
2	1	7	10				2											43	2
3		2	5					1		1						1	1	22	3
1		2																6	
			2															2	
																		1	
1	4		6															25	
	1																	6	
1	3	2	2							7		1						31	
3	2		3				1			1								25	1
2	19	1	13							2	3	1						143	1

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS OF

Diseases.	Employees.										
	Discharges.						Deaths.				
	White.				Black.		White.				Black
	Americans.		Europeans.				Americans.		Europeans.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.
General Diseases—Continued.											
Diseases of the eyes and their annexa	8			8	71	1					1
Follicular conjunctivitis	3				3	1					
Trachoma					4						
Diseases of the ears	13	1		2	9						
Diseases of the circulatory system.											
Pericarditis											
Acute endocarditis											1
Organic diseases of the heart	1			2	42		2	1			6
Angina pectoris	1										
Diseases of the arteries, atheroma, etc.					1						1
Aneurysm	1				3						1
Arteriosclerosis	2				5						1
Embolism and thrombosis.					1						
Diseases of the veins (varices, hemorrhoids, phlebitis, etc.)	8				2						
Hemorrhoids	17	2			26						
Varices	1				3						
Varicocele	7				2						
Phlebitis					2						
Diseases of the lymphatic system (lymphangitis, etc.)	2	1			9						
Lymphadenitis (nonvenereal)	4	1		2	35						
Hemorrhage; other diseases of the circulatory system	1										1
Diseases of the respiratory system.											
Diseases of the nasal fossæ	16	2			5						
Adenoid vegetations											
Myiasis of nasal fossæ and sinuses	1										
Diseases of the larynx					1						
Laryngitis											
Diseases of the thyroid body	1										
Acute bronchitis	19	2		9	16	1					
Chronic bronchitis	2	2		4	4			1			
Broncho-pneumonia				1	5						3
Pneumonia (unqualified)								1			
Lobar pneumonia		1		1	40						25

Nonemployees.											Nonresidents.									
Discharges.					Deaths.						Discharges.				Deaths.					
White.			Black.		White.			Black.			White.	Black.			White.		Black.		Total discharges.	Total deaths.
Soldiers.	Others.				Soldiers.	Others.														
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.		
74	6	5	23	29							5		3						233	
7		2	3	3															22	
				1									1						6	
108	19	16	8	15							5	1							197	
			1							1									1	1
1		1																	2	1
9	4	8	4	13	3	1		5		4	5					2			36	25
		1																	2	
																			1	
2										11									5	2
	4					1		7		3	1								12	12
	1																		2	
4		3	1	3							4								25	
52	9	10	2	9							3	2							125	
7																			11	
58	3		1								2								73	
																			2	
18	9	2	3	9							2								55	
59	7	5	6	1							2								122	
1		1								1									3	2
79	2	3		4							1								112	
1	3	3	1																8	
4	1	4		1															11	
			1	1															3	
5			1									1							7	
4	1	5																	11	
55	21	15	13	13						1	9	1	2						176	1
17	2	3	1	1							5								41	1
6		3	5	4	1			6		2									24	12
3		2	2	1			3				1								9	4
13	4	2	23	17	12	3	1	7		15	2					5			103	68

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS OF

Diseases.	Employees.											
	Discharges.						Deaths.					
	White.				Black.		White.				Black.	
	Americans.		Europeans.				Americans.		Europeans.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the respiratory system.—Continued.												
Pleurisy	9	1			14	1						
Empyema												
Pulmonary congestion, pulmonary apoplexy											1	
Gangrene of the lungs												
Asthma	3			1	2						1	
Pulmonary emphysema	1	1										
Other diseases of the respiratory system (tuberculosis excepted)					1							
Abscess of lungs					1							
Diseases of the digestive system.												
Diseases of the mouth and annexa		2			5						1	
Diseases of the teeth and gums	5	2		1	8							
Stomatitis												
Diseases of the pharynx	3				2						1	
Pharyngitis	2				2							
Follicular tonsilitis	40	4		2	42	1			1			
Ulcer of the stomach	8		1	3	6							
Other diseases of the stomach (cancer excepted)	4				2							
Acute gastritis	7	1			1							
Chronic gastritis	5	1	1		5							
Acute indigestion	3	1			4							
Diarrhea and enteritis (under 2 years)												
Colitis (under 2 years)	1				1							
Diarrhea and enteritis (2 years and over)	7		3		24							
Colitis (2 years and over)	3	1			3							
Ankylostomiasis			2		11							
Intestinal parasites	2	1	1		1							
Ascariasis			2									
Teniasis	1											
Appendicitis and typhilitis												
Acute appendicitis	18	3	1		8							
Chronic appendicitis	16	6			1							
Hernia, intestinal obstructions					1							
Inguinal hernia	12		7		119							
Other hernias	3				1							

THE PANAMA CANAL FOR THE YEAR, 1918.—Continued.

Nonemployees.										Nonresidents.									
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White.		Black.		Total discharges.	Total deaths.
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M	F.	M.	F.	M.	F.	M.	F.		
11	1		7	10				1		4					1			58	1
	1							1										1	2
1									1									1	
									1						1				1
19	4	2		2														33	1
1				1														4	
																		1	
	2																	3	
8	3	4		5														21	1
14	4	9	2	3						3								53	
1	3	5	3	6														18	
5	7	3	2															22	1
3	5	7		4														23	
157	67	77	38	70						11	2							511	1
3	5	3		2						1								32	
8	3	4		2						1								24	
11	2	2								1								25	
6		2		1														21	
7	3	4		7						2								31	
	6	6	6	2		1	1	1	2									20	5
1	4	5	2															14	
11	8	9	7	11				1	1									80	2
14	1	4	1	1				1	1	1								29	2
71	3	2		3				2		1								93	2
3	1	1	1	1														12	
		1		1														4	
1		3																5	
3																		3	
49	18	14	1	5	2					3		1						121	2
36	6	27		2						4								98	
																		1	
50	12	2	20	5						8		2						237	
8		2	5	6						1								26	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS OF

Diseases.	Employees.											
	Discharges.						Deaths.					
	White.				Black.		White.				Black.	
	Americans.		Europeans.				Americans.		Europeans.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the digestive system — Continued.												
Intestinal obstruction	1				1						3	
Other diseases of the intestines	14		3	1	25						1	
Constipation			1	1	6							
Duodenal ulcer	5				4							
Hydatid tumor of the liver												
Cirrhosis of the liver	1		2		1						2	
Biliary calculi	2		1									
Other diseases of the liver	4	1			2							
Abscess of liver (unqualified)	1										1	
Abscess of the liver, entamebic		2			1							
Cholecystitis	5	4	2		2							
Diseases of the spleen												
Simple peritonitis (nonpuerperal)						1					2	
Other diseases of the digestive system (cancer and tuberculosis excepted)					2							
Nonvenereal diseases of the genito-urinary system and annexa.												
Acute nephritis					2						3	
Bright's disease (chronic nephritis)	5		2		28		2				11	
Other diseases of the kidney and annexa	7		2		4							
Movable kidney	1											
Pyelo-nephrosis	4											
Calculi of the urinary passages	8				2							
Diseases of the bladder					1							
Cystitis	6	2	2		1							
Diseases of the urethra, urinary abscess, etc			1		35							
Stricture of the urethra, nonvenereal	4		1		36							
Diseases of the prostate	1											
Acute prostatitis												
Chronic prostatitis	1											
Hypertrophy of prostate												
Nonvenereal diseases of the male genital organs	5		3		39							
Hematocele												
Hydrocele	3				50							
Lymph scrotum and varix												
Uterine hemorrhage (nonpuerperal)		1										
Uterine tumor (noncancerous)												

THE PANAMA CANAL FOR THE YEAR. 1918.—Continued.

Nonemployees.										Nonresidents.									
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White		Black.		Total discharges.	Total deaths.
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
1					1			1										3	5
35	6	20	3	8						5								120	1
9	2	8	1	6						1	1							36	
3	1									1								14	
	1																	1	1
2						1		2										6	6
	2	7						1			1							13	1
24	3	2	1	1	1			1		3								41	2
	1							1										2	2
4																		4	
2	3	4		2						1								25	
			1															1	
1		2	1	7					5									12	7
	6	4		2							1	1						16	
	4	3	3	5				1	2									17	6
8	5	6	5	12		1		4	5	2				1				73	24
8	6	20		12						2	1							62	
																		1	
7	1	6		3				2	1	1				1				22	4
6	3	5								1								25	
		1	1	5					1	1								9	1
4		24	2	1						1								43	
3		4	2	5						1								51	
9	1		2							1								48	
1																		1	
1	2																	3	
6																		7	
	1									1								2	
69	19		12							5		1						153	
			1															1	
18	1		2							1								75	
			1															1	
		10		6														17	
		3		31														34	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.											
	Discharges.						Deaths.					
	White.				Black.		White.				Black.	
	Americans.		Europeans.				Americans.		Europeans.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Nonvenereal diseases of the genito-urinary system and annexa—Cont.												
Other diseases of the uterus		4				1						
Metritis		1										
Cysts and other tumors of the ovary						2						
Salpingitis and other diseases of the female genital organs		3				4						
Nonpuerperal diseases of the breast (cancer excepted)		1										
Benign tumor of breasts												
The puerperal state.												
Normal labor		1										
Accidents of pregnancy		1										
Extra-uterine pregnancy												
Hyperemesis gravidarum		1										
Abortion		1				2						
Puerperal hemorrhage												
Other accidents of labor												
Puerperal septicemia												
Puerperal albuminuria and convulsions												
Eclampsia												
Puerperal phlegmasia alba dolens, embolus, sudden death												
Following childbirth (not otherwize defined)												
Puerperal insanity												
Puerperal diseases of the breast												
Diseases of the skin and cellular tissue.												
Gangrene											1	
Furuncle	2	1	1		7							
Carbuncle	3		1		1	1						
Acute abscess	4	4	5		41							
Phlegmon and cellulitis	13		6		29	1		1	1	1		
Trichophytosis												
Scabies					2							
Pemphigus contagiosus												
Elephantiasis					1							
Myiasis of skin			1									
Dhobie itch	2				4							

OF THE PANAMA CANAL FOR THE YEAR, 1918.—Continued.

Nonemployees.										Nonresidents.									
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White			Black.		White.		Black.		White		Black.		Total discharges.	Total deaths.
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
		47		74							1							127	
		4		20														25	
		17		34														53	
		39		109					2									155	2
				8														9	
		56		22							1							79	
		178		101							1							281	
		14		28														43	
		11		4					1									15	1
		25		11					2									37	2
		42		26					1									71	1
		6		5					2									11	2
		21		17														38	
		1		2			1		2									3	3
		2		3														5	
				2					1		1							3	1
				1														1	
				5														5	
		1																1	
		6																6	
		1	1					1										2	2
8	1	15	2															37	
4		1		2						1								15	
37	7	11	19	25						9		1						163	
29	6	7	2	5						7		1						106	3
2																		2	
	1	1																4	
		1	2	2														5	
																		1	
																		1	
13				2						1								22	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.											
	Discharges.						Deaths.					
	White.				Black.		White.				Black.	
	Americans.		Europeans.				Americans.		Europeans.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the skin and cellular tissue. (Continued.)												
Prickly heat	2											
Ulcer of the skin	4		1		31							
Impetigo contagiosa	1		1		3							
Urticaria		2										
Ingrowing nail	9	2			1							
Other diseases of the skin and annexa	13	1	1		15	1						
Diseases of the bones and of the organs of locomotion.												
Diseases of the bones (tuberculosis excepted)	4		1		4							
Caries (nontuberculous)												
Mastoid abscess		1										
Osteomyelitis					2							
Periostitis												
Diseases of the joints (tuberculosis and rheumatism excepted)	2				1							
Ankylosis					1							
Arthritis	3	1	1		21							
Synovitis	3											
Other diseases of the organs of locomotion	9				13							
Malformations.												
Congenital malformations (stillbirth not included)	1				29							
Diseases of early infancy.												
Newborn child												
Premature birth												
Congenital debility												
Atrophy of infants												
Malnutrition												
Other diseases peculiar to early infancy (including various consequences of labor)												
Old age.												
Senility												

OF THE PANAMA CANAL FOR THE YEAR, 1918.—Continued.

Nonemployees,										Nonresidents.						Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.			
White.			Black.		White.			Black.		White.		Black.		White.	Black.		
Soldiers.	Others.				Soldiers.	Others.											
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M. F.	M. F.		
	1															3	
3		5	9	13						3						69	
	5	5	1	1												17	
2		1		1												6	
15	3	7														37	
37	8	10	5	15						9						115	
8	1			3						2					1	23	1
		1		1												2	
4										1						6	
4		2	3	2												13	
1																1	
5	1	1		1												11	
1																2	
4	1	5	2	5						2	1					46	
8			1	2						1						15	
39	2	1	4	4						6					1	86	
20	9		22	4						1		1				87	
	13	102	58	49		1										347	1
	2	1	1	2		2	1	6	2							6	11
		1							1							1	1
									1								1
			8	6				12	11							14	23
			2				1	5								2	6
		1														1	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.											
	Discharges.						Deaths.					
	White.				Black.		White.				Black.	
	Americans.		Europeans.				Americans.		Europeans.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Affections produced by external causes.												
Suicide by poisoning							1					
Suicide by firearms												
Suicide by cutting or piercing instruments												
Poisoning by food	10	1	2		9	1						
Other acute poisonings	2				1							
Venomous bites and stings					1							
Conflagration					1							
Burns (conflagrations excepted)	3	1			10							
Absorption of deleterious gases (conflagration excepted)					1							
Traumatism by firearms	2											
Traumatism by cutting or piercing instruments	2		10		117							
Traumatism by fall	13		3		64						2	
Traumatism by machines	4		4		26						2	
Traumatism by other crushings	4				42						3	
Railroad traumatism	5		1		21						2	
Dynamite traumatism					1							
Traumatism by landslides											1	
Injuries by animals					2							
Starvation					1							
Effects of heat												
Heat exhaustion					1							
Lightning												
Electricity (lightning excepted)					1							
Homicide by firearms												
Homicide by cutting or piercing instruments												
Homicide by other means												
Fractures (cause not specified)	7		10		19							
Dislocations					6	1						
Sprains	5	1			11	2						
Other external violence	21	3	53		170	1					2	
Ill-defined diseases.												
Ill-defined organic disease	1				1							
Cause of death not specified or ill-defined											2	
Infections of undetermined origin	11		4		9						1	
No disease	5		2		31	1						
Feigned disease												
Total	772	135	280	6	2761	40	9	2	10	2	144	3

F THE PANAMA CANAL FOR THE YEAR, 1918.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White			Black		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
							1												2
					1														1
								1											1
20	3	3	5	1						1								56	
4		1		5														13	
2																		3	
1				1					1									3	
3	1		5	3					1	4		3						33	1
																		1	
13	3		5					3										23	3
12	3	2	12	6						4								168	
33	17	11	10	9	1	1		4	1	13		2				1		175	10
3			3							3								43	2
3	2	4	6			1			1									61	5
1	2		7	14	1													51	3
1																		2	
																			1
4	1																		
																		1	
1										1								2	
																		1	
1																		1	
										1								2	
									1										1
									2										2
					1														1
36	6	3	4	5						6								96	
4	1	1		1														14	
13	2	1	2															37	
39	5	6	13	9	1			1	1	13		1						334	5
3		1																6	
2	1							2	2									3	6
21	4	6	15	9	2					7	4							90	3
74	22	111	20	59						4	6							335	
2			1	3														6	
4317	922	1500	753	1497	42	23	13	122	139	498	35	60	12	17	1	5	3	13588	535

TABLE XI.—CONSOLIDATED HOSPITAL REPORT.
[A. = White Americans; F. = White foreigners; B. = Black.]

	Remaining January 1, 1918.			Admitted.			Died.			Discharged.		
	A.	F.	B.	A.	F.	B.	A.	F.	B.	A.	F.	B.
Ancon Hospital:												
Employees	13	26	148	757	208	2,739	8	7	104	737	213	2,527
Soldiers	48			4,124			25			4,012		
Panama pay patients						4			1			
Other pay patients	11	24	80	1,324	661	1,458	11	13	132	1,282	628	1,331
Charity patients	31	5	25	336	58	484	3	3	29	352	53	444
Total	103	55	253	6,541	927	4,685	47	27	266	6,383	894	4,304
Corozal Hospital (insane):												
Employees	1	2	8	3	2	16	1	1	4	2	1	4
Soldiers	4			41						37		
Panama pay patients	4	46	200		30	85	1	6	42		11	19
Other pay patients		2	6		6	13			6		5	11
Charity patients		8	69	1	5	27			12			14
Total	9	58	283	45	43	141	2	7	64	39	17	48
Grand total	112	113	536	6,586	970	4,826	49	30	330	6,422	911	4,352
Corozal Farm (cripples):												
Employees		9	51		5	34					6	41
Chronic ward:												
Charity patients			23			15						7
Nonresidents:												
Hospital		18			432			9			399	
Asylum		59			6			1			5	
Colon Hospital:												
Employees	6	2	14	174	38	479			37	177	30	309
Soldiers	2			318	56	1	15			238	47	1
Panama pay patients			2	2	11	94			11	1	5	52
Other pay patients	20	4	5	354	272	395	8	11	28	312	199	319
Charity patients	1		2	71	18	58		1	5	60	13	40
Total	29	6	23	919	395	1,027	23	12	77	788	296	721
Palo Seco Leper Asylum:												
Panama pay cases		1	37		1	13			4			3
Charity patients		1	28			7		1	3			1
Total		2	65		1	20		1	7			4
Grand total:												
Employees	20	39	221	934	253	3,268	9	8	141	914	250	2,881
Soldiers	54			4,483	56	1	40			4,285	47	1
Panama pay patients	4	47	239	2	42	196	1	6	58	1	16	74
Other pay patients	31	30	91	1,678	939	1,866	19	24	166	1,594	832	1,663
Charity patients	32	14	147	408	81	591	3	5	45	413	68	506
Nonresidents*		77			438			18			404	
Total	141	207	698	7,505	1,809	5,922	72	61	414	7,207	1,617	5,125

* Prior to April 1, 1918, nonresident patients of Corozal Hospital were not included in its report; and accordingly do not appear in the quarterly report of this department, for January, February, and March, 1918.

TABLE XI.—CONSOLIDATED HOSPITAL REPORT.—Continued.
[A. = White Americans; F. = White foreigners; B. = Black.]

	Transferred.			Remaining December 31, 1918.			Average number constantly sick.			
	A.	F.	B.	A.	F.	B.	A.	F.	B.	Total.
Ancon Hospital:										
Employees	2	5	31	23	9	225	21.19	146.21	140.99	308.39
Soldiers	32	...	...	103	...	...	127.59	...	...	127.59
Panama pay patients	...	...	3	...	...	...	...	...	.22	.22
Other pay patients	1	8	23	41	36	50	35.11	27.56	67.29	129.96
Charity patients	...	5	22	12	2	14	13.33	3.53	24.78	42.04
Total	35	18	79	179	47	289	197.22	177.70	233.28	608.20
Corozal Hospital (insane):										
Employees	...	...	2	1	2	14	1.53	2.23	10.11	13.87
Soldiers	1	...	...	9	...	...	7.11	...	...	7.11
Panama pay patients	...	...	2	3	59	222	3.05	51.54	210.48	265.07
Other pay patients	...	...	...	...	3	2	.....	4.00	4.84	8.84
Charity patients	...	...	...	...	13	70	.31	10.01	69.00	79.32
Total	1	...	4	13	77	308	12.09	67.78	294.43	374.21
Grand total	36	18	83	192	124	597	209.22	245.48	577.71	982.41
Corozal Farm (cripples):										
Employees	...	1	...	...	7	44	.....	6.48	40.55	47.03
Chronic ward:										
Charity patients	...	...	5	...	...	26	.....	0.15	30.75	30.90
Nonresidents:										
Hospital	...	3	...	...	39	...	.....	18.63	.....	18.63
Asylum	...	...	...	...	51	...	.....	40.81	.....	40.81
Colon Hospital:										
Employees	4	7	141	1	3	10	3.85	1.34	15.05	20.24
Soldiers	60	8	...	7	1	...	8.45	1.21	.01	9.67
Panama pay patients	1	5	31	...	1	2	.02	.28	2.05	2.35
Other pay patients	45	58	39	9	8	14	9.21	6.57	14.47	30.25
Charity patients	8	2	14	4	...	1	2.00	.35	.89	3.24
Total	118	80	225	21	13	27	23.53	9.75	32.47	65.75
Palo Seco Leper Asylum:										
Panama pay cases	...	...	...	...	2	43	.....	1.21	40.78	41.99
Charity patients	...	...	...	...	...	31	.....	.95	28.03	28.98
Total	...	...	...	...	2	74	.....	2.16	68.81	70.97
Grand total:										
Employees	6	13	174	25	21	293	26.57	156.26	206.70	389.53
Soldiers	93	8	...	119	1	...	143.15	1.21	.01	144.37
Panama pay patients	1	5	36	3	62	267	3.07	53.03	253.53	309.63
Other pay patients	46	66	62	50	47	66	44.32	38.13	86.60	169.05
Charity patients	8	7	41	16	15	142	15.64	15.39	153.45	184.48
Nonresidents*	...	3	...	...	90	...	.....	59.44	.....	59.44
Total	154	102	313	213	236	768	232.75	323.46	700.29	1,256.50

* Prior to April 1, 1918, nonresident patients of Corozal Hospital were not included in its report; and accordingly do not appear in the quarterly report of this department, for January, February and March, 1918.

TABLE XII.—CONSOLIDATED DISPENSARY REPORT.

EMPLOYEES TREATED IN QUARTERS.

	Remaining Jan. 1, 1918.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31, 1918.		Days lost.		
	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	Total
Ancon	2	...	1,181	...	...	...	1,157	...	18	...	8	...	2,582	...	2,582
Balboa	3	2	1,968	151	...	...	1,876	72	93	75	2	6	4,903	495	5,398
Pedro Miguel	2	...	198	8	...	...	193	6	7	2	...	...	459	21	480
Paraiso (1)	...	...	16	32	...	...	11	20	5	12	...	...	42	66	108
Gamboa (2)	...	...	...	6	...	...	...	6	...	...	...	...	...	14	14
Gatun	...	...	154	81	...	...	129	59	24	22	...	...	372	522	894
Cristobal	1	15	988	1502	...	...	981	1470	1	4	7	43	2,624	14018	16642
Total	8	17	4,505	1780	...	...	4,338	1633	158	115	17	49	10982	15136	26118

ALL CASES TREATED BUT NOT EXCUSED.

	Employees.			Nonemployees.			Total.		
	W.	B.	Total.	W.	B.	Total.	W.	B.	Total.
Ancon	12,524	43,743	56,267	11,944	23,990	35,934	24,468	67,733	92,201
Balboa	46,152	31,785	77,937	41,639	20,941	62,580	87,791	52,726	140,517
Pedro Miguel	17,644	24,570	42,214	15,277	15,200	30,477	32,921	39,770	72,691
Paraiso (1)	3,029	8,286	11,315	1,987	3,809	5,796	5,016	12,095	17,111
Gamboa (2)	404	2,571	2,975	250	2,917	3,167	654	5,488	6,142
Gatun	3,539	10,747	14,285	6,117	7,758	13,875	9,655	18,505	28,160
Cristobal	14,924	48,061	62,985	15,585	20,899	36,484	30,509	68,960	99,469
Total	98,215	169,763	267,978	92,799	95,514	188,313	191,014	265,277	456,291

(1) Paraiso dispensary closed, effective May 14, 1918.
(2) Gamboa dispensary closed, effective August 1, 1918.

TABLE XIII.—CONSOLIDATED ADMISSION REPORT.

	White.	Black.	Total.
Admissions to hospitals, excluding Corozal farm and chronic ward	9,318	5,933	15,251
Admissions of employees to quarters	4,505	1,778	6,283
Total admissions to hospitals and quarters	13,823	7,711	21,534
Less number of patients transferred between hospitals and from quarters to hospitals, whose admissions are duplicated in the above figures	415	453	868
Net admissions to hospitals and quarters	13,408	7,258	20,666
EMPLOYEES.			
Employees admitted to hospitals	1,187	3,268	4,455
Employees admitted to quarters	4,505	1,778	6,283
Total admissions of employees	5,692	5,046	10,738
Less number transferred between hospitals and from quarters to hospitals, whose admissions are duplicated in the above figures	178	289	467
Net admissions of employees	5,514	4,757	10,271
Annual admission rate per thousand employees to hospitals and quarters	1,254.21	231.06	465.67

TABLE XIV.—NUMBER OF EMPLOYEES CONSTANTLY SICK IN HOSPITALS AND QUARTERS.

	White.	Black	Total.
Hospitals:			
Ancon Hospital	38.25	151.10	189.35
Colon Hospital	5.19	15.05	20.24
Total	43.44	166.15	209.59
Quarters:			
Ancon	5.59	.....	5.59
Balboa	10.02	2.00	12.02
Pedro Miguel	1.44	38	1.82
Paraiso	.24	.36	.60
Gamboa	.....	.48	.48
Gatun	1.28	2.85	4.13
Colon	6.33	31.92	38.25
Total	24.90	37.99	62.89

TABLE XV.—AVERAGE NUMBER OF DAYS IN HOSPITAL OR QUARTERS FOR EACH ADMISSION OF SICK EMPLOYEE.

	White.	Black.	Total.
Hospitals:			
Ancon Hospital	12.69	19.45	17.59
Colon Hospital	10.55	11.04	10.24
Total (average)	11.95	18.13	16.40
Quarters:			
Ancon	2.25		2.25
Balboa	2.48	3.45	2.55
Pedro Miguel	2.27	1.92	2.30
Paraiso	3.21	2.24	2.49
Gamboa		2.28	2.28
Gatun	2.58	7.19	4.10
Colon	2.95	13.35	9.06
Total (average)	2.52	11.80	5.19

TABLE XVI.—NUMBER OF DAYS HOSPITAL TREATMENT FURNISHED VARIOUS CLASSES OF PATIENTS.

Class.	White	Foreign.	Black.	Total.
Ancon Hospital:				
Panama Canal employees	7,736	4,836	51,477	64,049
Army and Navy patients	46,648			46,648
Panama Government pay patients			81	81
Other pay patients	12,823	10,066	24,579	47,468
Charity patients	4,843	1,435	9,060	15,338
Total	72,050	16,337	85,197	173,584
Corozal Hospital (insane):				
Panama Canal employees	558	814	3,693	5,065
Army and Navy patients	2,599			2,599
Panama Government pay patients	1,413	18,825	76,533	96,771
Other pay patients		1,434	1,761	3,195
Charity patients	112	3,657	25,177	28,946
Total	4,382	24,730	107,464	136,576
Corozal Farm (injured employees):				
Panama Canal employees		3,167	16,576	19,743
Chronic ward: Charity patients			9,603	9,603
Colon Hospital:				
Panama Canal employees	1,405	490	5,478	7,373
Army and Navy patients	3,115	445	2	3,562
Panama Government pay patients	10	197	1,487	1,694
Other pay patients	3,361	2,402	5,290	11,053
Charity patients	732	130	326	1,188
Total	8,623	3,664	12,583	24,870
Palo Seco Leper Asylum (lepers):				
Panama Government pay patients		390	12,302	12,692
Charity patients		270	8,461	8,731
Total		660	20,763	21,423

TABLE XVII.—WARD LABORATORY REPORTS.

	Ancon Hospital.	Colon Hospital.	Santo Tomas Hospital.
Blood examinations (total number)	9,229	1,656	1,437
Differential counts	332	192	25
Estivoautumnal	662	132	256
Quartan	15	.....	.....
Undetermined (for malaria)	2	.....	.....
Mixed	2	.....	.....
Crescents	10	.....	.....
Teritan malaria	129	34	44
Filaria	28	.....	.....
Hemoglobin estimations	4,096	44	.....
Red blood counts	85	25	8
White blood counts	1,074	256	119
Spirocheta obermeyeri	.....	2	.....
Stool examinations (total number)	9,384	484	8,282
Ameba	137	8	29
Ascaris lumbricoides	151	.....	864
Balantidium coli	6	.....	2
Ciliated monads	153	22	22
Entameba (histolytica and tetragena)	45	.....	1
Guaiac tests	173	.....	.....
Pus and blood	625	57	17
Blood	.....	3	21
Mucus and pus	.....	.....	39
Strongyloides	271	5	205
Tænia saginata	15	.....	.....
Tricocephalus dispar	610	6	307
Uncinaria (ova)	1,095	21	1,953
Cercomonas, intestinal	3	.....	.....
Bilharzia	19	.....	.....
Oxyuris vermicularis	.....	1	1
Pus	.....	1	.....
Urine examinations (total number)	22,823	2,858	7,466
Albumen	5,629	466	1,471
Bile	211	.....	6
Casts	4,380	285	729
Ciliated monads	118	.....	.....
Epithelia	6,219	159	169
Guaiac tests	123	.....	.....
Hemin crystals	125	71	.....
Urates	.....	6	1
Oxalate of lime	.....	9	.....
Mucus and pus	.....	432	548
Indican	2,011	3	.....
Pus and blood	9,080	624	184
Sugar	4,357	16	61
Blood	30	182	74
Phosphates	.....	53	89
Red cells	18	30	.....
Acetone	.....	13	.....
Trichomonas vaginatio	4	.....	.....
Hyaline casts	.....	.....	145
Granular casts	.....	.....	93
Sediment	.....	38	.....

TABLE XVII.—WARD LABORATORY REPORTS.—Continued.

	Ancon Hospital.	Colon Hospital.	Santo Tomas Hospital.
Sputum examinations (total number)	5,178	297	1,173
Positive for tubercle bacilli	430	34	206
Positive for pneumococcus	.....	2	2
Positive for Frankle's cocci	.....	1	.....
Positive for streptococci	.....	1	.....
Smear examinations (total number)	882	46	1,479
Eye	7	.....	.....
Spinal fluid	336	.....	14
Urethral and vaginal	582	13	6
Positive for gonococci	.....	7	474
Positive for leprosy	.....	.....	10
Positive for ameba	.....	.....	1
Positive for diplo. meningitis	.....	.....	1
Chest	3	.....	.....
Positive for streptococci	.....	.....	5
Positive for diphtheria	.....	.....	22
Positive for Koch-Weeks B	.....	.....	3
Positive for spirochetæ pal	.....	.....	1
Nasal smears	20	.....	.....
Smear from foot	1	.....	.....
Throat cultures	.....	.....	86
Blood cultures	.....	.....	18
Widal reactions	.....	.....	22
Positive for B. diphtheria	.....	.....	6
Surgical tissues	.....	.....	59
Pathological tissues	.....	.....	344
Wasserman tests	.....	.....	2,108
Positive	.....	.....	245
Autopsies performed	.....	.....	114
Total	90,828	8,557	31,380

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.
	Number.	Died.	Number.	Died.	Number.
Amputations:					
Arm			1	1	3
Hand			3		
Thigh	1		3	2	1
Leg	4		2		8
Foot	1				1
Digits, multiple	9		6		19
Forearm	1				1
Digits, single	4				
Amputations of thigh					1
Leg, double	1				
Operations on bones:					
Craniectomy, decompressive	2	1	10	5	
Resection of knee	1				
Resection of ankle					1
Ostiectomy	9		6		1
Wiring of fractures, simple	11		2		1
Plating of fractures, simple	5		1		
Wiring of fractures, compound	1		1		1
Plating of fractures, compound	2				
Resection of elbow	1				
Laminectomy	3	1	2	1	
Excision of maxilla	1		1		
Excision of coccyx			1		
Bone transplantation	7		1		
Anthrotomy of knee	1				
Lane plate of femur			1		
Amtroplastry			1		
Adenectomy:					
Cervical	17		4		4
Axillary	6				
Inguinal, single	180		12		116
Inguinal, double	47		9		9
Femoral	25				
Ventral	6				3
Herniotomy:					
Inguinal, single	153	1	69		98
Inguinal, double	47		22		19
Ventral	17		7		12
Strangulated	4	1	3		6
Combined					1
Femoral	2				1
Genito-urinary tract:					
Nephrectomy	3				
Perinephritic abscess, drainage of	2				
Cystotomy	1		4	1	2
Urethrotomy, internal	21				21
Urethrotomy, external	26		1		47
Prostateomy	2		1		1
Hydrocele, single, radical cure	67		18		26
Hydrocele, double, radical cure	4		1		7
Orchidectomy	10		1	1	11
Epididymotomy	43				1
Amputation of scrotum	37				1
Amputation of penis					6

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED—Continued.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.
	Number.	Died.	Number	Died.	Number
Genito-urinary tract—Continued.					
Curettage uteri	196	1	16		124
Perineoplasty	24		19		1
Trachelorrhaphy	9		10		1
Vaginal sections					19
Circumcision	107				98
Nephrotomy	5				
Urethrotomy	2				
Hydrocele, double	7				
Varicocele, radical cure	38		21		
Ureterotomy					1
Vaginal punctures					22
Obstetrical:					
Cæsarian section, abdominal	4		1	1	1
Cæsarian section, vaginal	2				
Accouchement, forceps	6		1		
High forceps	1		4		
Low forceps	10		5		
Version	8		4		
Perineorrhaphy	26		1		
Breech extraction	2		5		
Sixth month precipitate			1		
Placenta previa			2	1	
Precipitate labor with adherent placenta, gas bacillus			1	1	
Thorax:					
Thoracotomy	6	1	2	1	
Excision of breast and axilla	2		1		1
Rectum:					
Hemorrhoids, radical cure	122		23		77
Fistula in ano, excision of	28		8		
Prolapsus, rectum, radical excision			2		
General:					
Thyroidectomy	11				3
Varicose veins excision of	16		4		1
Tenorrhaphy	7				1
Excision of surface neoplasms	29		4		
Plastic operations for severe injuries	5		17	2	
Plastic operations for effects of disease	5		23	3	
Skin graft	1		4		30
Tracheotomy			1	1	
Nephrectomy					1
Nephropexy					1
Nerve stretching	5				
Minor operations, various	904		45		152
Enterectomy	1		1	1	
Enterorrhaphy	1				
Plastic operation for chronic peritonitis	3	1	1	1	
Gunshot wound of abdomen	5		2	1	
Stab wound of abdomen	1	1	3		
Release, intestinal adhesions	2				
Amputation, cervix	1				
Rupture of spleen					1
Rupture of the bowel and general peritonitis			1	1	
Hematoperitoneum			1	1	
Extensive injuries to soft parts, operation for	4				

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED—Continued.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.
	Number.	Died.	Number	Died.	Number.
General—Continued:					
Tuberculous peritonitis			1		
Plastic operation for intestinal obstruction			1		1
Excision of lower lip			1		
Plastic operation for congenital defects	1		1		
Plastic tattoo	1				
Laparotomy:					
For tuberculous peritonitis	6	1	2		3
For intestinal obstruction	3	1	1	1	
Exploratory	6		1		5
Gastro-enterostomy	11		1	1	11
Appendectomy	92		75		99
Appendectomy with local peritonitis	11		5		
Gastrotomy					1
Cholecystostomy	4				3
Cholecystotomy	3		1		1
Abscess of liver, laparo-hepatotomy for	3	2	1		5
Abscess of liver thoraco-hepatotomy for	3	1			
Pan-hysterectomy	13	1	25		68
Supravaginal hysterectomy	19	1	2		4
Hysteromyomectomy	13		2		
Salpingectomy, single	3		1		18
Salpingectomy, double	1		34		29
Salpingo-oophorectomy	16		35		57
Ovarian cystectomy	10		11		1
Oophorectomy	1		20		22
Suspensio-uteri	31		53		69
For ectopic gestation	5		1		
For esophageal stricture	1	1			
Mayo bunion, bilateral	2				
Major operations, various other	20				18
Minor operations, various other	1354		54		560
Appendectomy with general peritonitis	4	2	13	1	
Salpingostomy					3
Splenectomy					5
Gunshot wound of abdomen			1	1	
Stab wound of abdomen			2		
Arsphenamine, intravenous	1798				
Reduction of humerus	1				
Reduction of forearm	3				
Reduction of Pott's fracture	1				
Dislocation, elbow	1				
Dislocation, shoulder	1				
Nailing of fractured femur	1				
Open reduction of metacarpal	1				
Circumcision	181				92
For general peritonitis	1		1		
Gastrectomy	1				
Entero-enterostomy	1				
Cauterization of chancroids	47				
Excision of bunions	4				
Excision of tattoo marks	12				
Orthroplasty	1				
Total	6083	18	771	30	2563

TABLE XIX.—REPORT OF OPERATIONS, EYE AND EAR DEPARTMENTS.

ANCON HOSPITAL.

Operations performed:	
Expression of eye	2
Uvilectomy	1
Incision and drainage, peritonsillar abscess	16
Incision and drainage, furnicle ear	4
Adenoidectomy	255
Cataract removal	6
Evisceration	4
Chalasion excisions	38
Iridectomy	5
Mastoidectomy	14
Needling of eye	20
Paracentesis	58
Pterygium transplantations	41
Removal of nasal polyps	17
Scleral trephine	1
Spur, removal of	5
Submucous resection	61
Tonsillectomy	426
Turbinectomy	44
Ectropion, upper lid	1
Paracentesis of ear	6
Scarification of eyelid	2
Cautery of turbinates	3
Ethmoid curettement	3
Minor operations	53
Removal of foreign body, eye	1
Removal of foreign body, nose	2
Lacrymal sac, removal of	1
Lacrymal duct, Bowman's dilation of	1
Myiasis of evelid, removal of	1
Maxillary sinus, perforation and drainage of	1
Reduction of compound fracture, nose	2
Removal of polyps from ear	1
Plastic eyelid	3
Enucleation	1
Removal of foreign body from ear	2
Removal, radical, frontal sinus	1
Incision abscess, epiglottis	1
Rhinoplasty	3
Incision and drainage hordeolum	1
Total	1,050
Refractions	1,312

SANTO TOMAS HOSPITAL.

Ear:	
Furunculosis of canal	27
Otitis media, acute	189
Otitis media, chronic	519
Foreign bodies	24
Polyps of canal	7
Suppurative otitis	43
Mastoid operations	5
Perforation of drum	17
Eye:	
Foreign bodies	14
Conjunctivitis	400
Phlyctenular conjunctivitis	80
Chronic glaucoma	1
Corneal ulcer	117
Keratitis	236
Iritis	106

Eye—Continued:	
Hordeolum	17
Chalazion	21
Cataract	579
Blepharitis	29
Papillitis	2
Enucleations	6
Eye examinations	79
Gonorrheal opthalmia	9
Retinitis	56
Glaucoma	8
Nose and throat:	
Ethmoiditis	9
Suturing of soft palate	1
Tonsillitis	320
Pharyngitis	131
Peritonsillar abscess	53
Alveolar abscess	1
Rhinitis	103
Hypertrophy of turbinates	77
Laryngitis	51
Foreign bodies	8
Operations:	
Screw worm infection	6
Tumor of nose	9
Cataract	32
Pterygium	103
Lachrymal fistula	1
Iridectomy	39
Mastoid	3
Tonsillectomy	133
Adenoidectomy	37
Turbinectomy	9
Submucous resection	11
Removal of nasal polyps	3
Pterygium transplantations	6
Dislocation of lens	19
Occlusion of lachrimal	3
Minor	25

TABLE XX.—REPORT OF X-RAY DEPARTMENT, ANCON HOSPITAL.

Nature of examinations:	
Arm and forearm	89
Chest	322
Dental	236
Elbow	41
Foreign bodies	25
Foot and ankle	124
Gall bladder	27
Gastro-intestinal	47
Hand	83
Head	46
Hip	26
Jaw	57
Kidneys	78
Knee	43
Legs	41
Liver	4
Ribs	10
Shoulder	42
Sinews	70
Spine	52
Spleen	3
Stomach	132
Thigh	33
Wrist	52
Treatments	67
Others of abdomen	151

Nature of examinations—Continued.	
Pelvis	14
Upper extremities	322
Lower extremities	274
Total	2,511

CLASSIFICATION OF PLATES AND FILMS

Dental films	687
6½ by 8½	1,118
8 by 10	2,146
10 by 12	1,477
14 by 17	984
Total	6,412

TABLE XXI.—SANTO TOMAS HOSPITAL.

PATIENTS TREATED.

Class.	Remaining Jan. 1, 1918.	Admitted.	Died.	Discharged.	Remaining Dec. 31, 1918.
Pay cases	30	1,055	30	1,026	29
Charity cases	390	8,886	804	7,999	473
Total	420	9,941	834	9,025	502

Class.	Number treated.	American.		Other nations.	
		White.	Black.	White.	Black.
Pay cases	1,306	33	.....	446	827
Charity cases	13,005	52	.....	1,240	11,713
Total	14,311	85	.....	1,686	12,540

Number of days relief furnished patients	171,952
Average number of patients constantly sick	470
Average number of days treatment for each patient admitted	11
Cost of subsistence per patient, per day	$0.43

DISPENSARY REPORT.

Class.	White.	Black.	Total.
Natives treated	168	14,708	14,876
Foreigners treated	450	5,049	5,499
Total	618	19,757	20,375

DISEASES TREATED.

General diseases:	
Malaria	479
Measles	153
Scarlet fever	1
Diphtheria and croup	22
Influenza	325
Dysentery	35
Leprosy	12
Erysipelas	23
Other epidemic diseases	37
Purulent infection and septicemia	77
Pellagra	6
Beriberi	15
Tuberculosis of the lungs	132
Tuberculous meningitis	2
Abdominal tuberculosis	1
Pott's disease	3
Tuberculosis of other organs	17
Syphilis	329
Soft chancre	82
Gonococcus infection	703
Cancer and other malignant tumors of the stomach and liver	6
Cancer and other malignant tumors of the female genital organs	18
Cancer and other malignant tumors of the skin	7

DISEASES TREATED.—Continued.

Cancer and other malignant tumors of other organs	3
Other tumors	7
Acute articular rheumatism	35
Diabetes	3
Exophthalmic goiter	1
Anemia, chlorosis	50
Alcoholism—acute or chronic	109
Other chronic poisonings	5
Typhoid fever	1
Whooping cough	1
White swellings	1
Syphilis, period not stated	91
Cancer and other malignant tumors of the peritoneum, intestines, rectum	2
Cancer and other malignant tumors of other organs and of organs not specified	11
Other tumors (tumors of the female genital organs excepted)	17
Chronic rheumatism and gout	13
Leukemia	2
Smallpox	15
Tetanus	1
Acute miliary tuberculosis	1
Rickets	1
Other general diseases	5
Other chronic occupational poisonings	1
Cancer and other malignant tumors of the buccal cavity	1
Scurvy	1
Nervous diseases:	
Simple meningitis	2
Locomotor ataxia	4
Paralysis without specified cause	9
Other forms of mental alienation	54
Epilepsy	21
Convulsions	1
Convulsions of infants	2
Neuralgia and neuritis	35
Other diseases	17
Other diseases of the eyes and their anneva	173
Diseases of the ears	26
Other diseases of the spinal cord	4
Cerebral hemorrhage, apoplexy	8
Hysteria	4
Circulatory:	
Organic diseases of the heart	78
Diseases of the arteries, atheroma and aneurysm	71
Diseases of the veins (varices, hemorrhoids, phlebitus)	56
Diseases of the lymphatic system	184
Hemorrhage diseases of the circulatory system	3
Acute endocarditis	2
Other diseases of the circulatory system	3
Respiratory:	
Chronic bronchitis	104
Broncho-pneumonia	33
Pneumonia	37
Pleurisy	43
Asthma	16
Diseases of the nasal fossæ	10
Other diseases of the respiratory system	2
Digestive:	
Diseases of the teeth and gums	11
Other diseases of the mouth and anneva	3
Diseases of the pharnyx	181
Diseases of esophagus	1
Ulcer of the stomach	4
Other diseases of the stomach	7
Diarrhea and enteritis	72
Diarrhea and enteritis—2 years and over	151
Ankylostomiasis	462

DISEASES TREATED—Continued

Digestive—Continued.	
Intestinal parasites	55
Appendicitis and typhlitis	134
Hernias, intestinal obstructions	125
Diseases of the anus and fecal fistula	20
Other diseases of the intestines	46
Cirrhosis of the liver	13
Billary calculi	7
Other diseases of the liver	28
Simple peritonitis	2
Intestinal obstruction	9
Diseases of spleen	4
Genito-urinary:	
Bright's disease	140
Other diseases of the kidneys and annexa	7
Diseases of the bladder	14
Diseases of the urethra, urinary abscess, etc	65
Nonvenereal diseases of the male genital organs	78
Uterine hemorrhage (nonpuerperal)	7
Uterine tumor (noncancerous)	27
Metritis	97
Other diseases of the uterus	126
Salpingitis and other diseases of the female genital organs	118
Calculi of the urinary passages	2
Cysts and other tumors of the ovary	5
Nonpuerperal diseases of the breast (cancer excepted)	9
Acute nephritis	5
Puerperal state:	
Normal labor	874
Accidents of pregnancy	203
Other accidents of labor	1
Puerperal septicemia	3
Puerperal albuminuria and convulsions	1
Puerperal diseases of the breast	1
Puerperal hemorrhage	5
Skin, etc:	
Gangrene	5
Furunele	11
Acute abscess	128
Scabies	26
Other diseases of the skin and annexa	307
Trichophytosis	1
Bones:	
Diseases of the bones (tuberculosis excepted)	29
Diseases of the joints (tuberculosis and rheumatism)	58
Amputations	17
Other diseases of the organs of locomotion	9
Malformation:	
Congenital malformations (stillbirths not included)	45
Early infancy:	
Newborn child	827
Lack of care	1
Old age:	
Senility	12
Affections produced by external causes:	
Other acute poisonings	12
Burns (conflagrations excepted)	21
Traumatism by firearms	19
Traumatism by cutting or piercing instruments	77
Starvation	1
Excessive cold	4
Fractures (causes not specified)	73
Other external violence	138
Poisoning by food	1
Dislocations	2
Sprains	1
Venomous bites and stings	3

DISEASES TREATED.—Continued.

Ill-defined:	
Diseases not specified or ill-defined	29
No disease	125
Ill-defined organic diseases	3

TABLE XXII.— COROZAL HOSPITAL—STATEMENT OF COMMITMENTS, AND DISCHARGES.

COMMITMENTS.

	Male.	Female.
From Canal Zone:		
First admission	81	24
Second admission	4	1
Sixth admission	1	
Seventh admission	1	
From Panama Government:		
First admission	58	44
Second admission	4	2
Third admission	2	1
Totals	151	72

DISCHARGES.

	Well.		Improved.		Unimproved.	
	Male.	Female.	Male.	Female.	Male.	Female.
Antigua				1		
Barbados	1	4	1	2	1	
Colombia	1		4		2	
China			1			
England			2			
France			1			
Germany	1					
Italy			1			
India	1					
Jamaica	1	4	1	3		
Japan	1		1			
Martinique		1	1	2	1	
Mexico			1			
Panama	4	1	6	2	5	1
Porto Rico			8		3	
Peru					1	
St. Vincent			1			
St. Lucia				1		
Trinidad			1			
United States	2		18	1	7	
Totals	12	10	48	12	20	1

DEATHS.

Medical diagnosis.	Mental diagnosis.	Male.	Female.
Tuberculosis of lungs	Epilepsy	1	1
Epilepsy	Epilepsy	1	1
Organic brain disease	Organic brain disease	3	
Tuberculosis of lungs	General paralysis of insane	1	
Diarrhea and enteritis	Dementia precox	1	
Disseminated tuberculosis	Dementia precox		1
Undetermined	Dementia precox	2	
Sinusitis	Dementia precox	1	
Endocarditis	General paralysis of insane	1	
Tuberculosis of lungs	Toxic psychosis; pellagra		1
Endocarditis	Organic brain disease	1	
Lobar pneumonia	Dementia precox	1	
Organic disease of the heart	Dementia precox	1	
Arteriosclerosis	Paranoid state; psychosis associated with cerebral arteriosclerosis.	1	
Arteriosclerosis, tertiary syphilis	Organic brain disease	1	
Cirrhosis of liver, chronic nephritis	Dementia precox	1	
Pellagra	Toxic psychosis		1
Cerebral hemorrhage; apoplexy	Psychosis associated with epilepsy	1	
Cerebral hemorrhage; apoplexy	Psychosis associated with syphilis	1	
General paralysis of insane	General paralysis of insane	2	
Arteriosclerosis	Psychosis associated with arteriosclerosis	1	1
Pulmonary tuberculosis of lungs	Acute exhaustive psychosis		1
Tuberculosis of lungs	Psychosis associated with arteriosclerosis.	1	
Purulent infection and septicemia	Dementia precox	1	
Chronic nephritis	Toxic psychosis	1	
Tuberculosis of lungs	Dementia precox	2	2
Pyelonephritis	Toxic psychosis		1
Arteriosclerosis	Psychosis associated with arteriosclerosis.	1	
Tuberculosis of lungs	Phychosis associated with arteriosclerosis.		1
Septicemia	Dementia precox	1	
Arteriosclerosis	Manic depressive psychosis		1
Cerebral syphilis	Tertiary syphilis	1	
Gangrene of the lungs	Psychosis associated with epilepsy		1
Bright's disease	Dementia precox	1	
Chronic endocarditis	Dementia precox	1	
Uncinariasis	Dementia precox	1	
Miliary tuberculosis	Senile dementia		1
Lobar pneumonia	Epilepsy		1
Tuberculosis of lungs	Imbecility	1	
Tuberculosis of lungs	Cerebral syphilis	2	
Broncho pneumonia	Dementia precox	1	
Nephritis miliary tuberculosis	Imbecility	1	
Ischiorectal abscess	Dementia precox	1	
Tuberculosis peritonitis	Psychosis associated with epilepsy	1	
Syphilis artioscleresis	Toxic psychosis pellagra		1
Pellagra	Toxic psychosis pellagra		1
Paresis	Tertiary syphilis		1
Diffuse nephritis	Dementia precox		1
Cerebral syphilis	Cerebral syphilis	1	
Chronic intestitial nephritis	Psychosis associated with arteriosclerosis	1	
Epilepsy	Imbecility with epilepsy		1
Total		42	20

TABLE XXIII.—REPORT OF BOARD OF HEALTH LABORATORY.

Bacteriological examinations:	
Blood cultures, 5; pneumococcus, 1; streptococcus, 4; B. typhosus and pneumococcus, 9; staphylococcus aureus, 2; B. coli, 1; M. tetrag, 3; B. pycocyaneus, 1	191
Agglutination reactions (1 positive for B. typhosus) blood	5
Throat cultures (8 new positive B. diphtheria; 25 repeated positive; 42 positive for B. diphtheria) 7 new cases,.	539
Sputums, 53; (positive for B. tuberculosis)	164
Stools, 22 positive for B. dysenteria; 1 B. dysenteria "Flexner Strong" type; 4 typhosus; 2 B. fecates alkaligenes	335
Stools examined for ameba; 1 A. histolytica; 1 A. coli; a entameba histolytica	8
Stools, examination for intestinal parasites; 4 strongyloides; 8 hookworm; 9 tricocephalus disease; 2 ascaria	47
Urines; 48 B. coli; 5 staphylococcus; 1 B. typhosus	193
Examination of urethral pus	1
Pleural fluids (1 positive streptococcus) 1 B. pyocyaneus	5
Spinal fluids; 1 pneumococcus; 1 staphylococcus aureus	6
Synovial fluid	1
Cultures of knee fluid	1
Bile	1
Pus from right lung	1
Dark field examination of spirochete pallida	3
Leper suspects; 3 B. lepre	16
Cultures from autopsy; 1 pneumococcus	12
Vaginal smears	9
Brains of dogs for rabies	4
Milk from Corosal dairy; 4 specimens plated	112
Milk from Panama dairies (Health Office, Panama)	46
Milk from Commissary Division	125
Milk from Ancon Hospital kitchen	5
Blood smears for malarial parasites; 4 estivoautumnal malaria; 5 tertic; 1 quartan	68
Nasopharyngeal cultures (hospital)	21
Eye smears (2 year negative intracellular diplococci;) 2 gonnococcus	10
Tongue smears	1
Cultures of pleural fluid; 2 staphylococcus aureus; 1 pneumocus	19
Cultures of spinal fluids; 2 staphylococcus aureus; 1 meningococcus	56
Milk from Ancon Commissary	6
Milk from Health Office, Colon	4
Milk from Cristobal Commissary	3
Pus for vaccine	2
Naso-pharyngeal cultures from meningitis carriers; 24 meningococcus	79
Cultures from middle ear; 1 pneumococcus	1
Cultures from eye; 1 streptococcus	5
Autogenous vaccine prepared	1
Anti-typhoid vaccinations	8
Smallpox	32
Cultures of chest fluid	1
Blood smears examined for filaria	1
Blood smears examined for relapsing fever	1
Sputum—cultures from pneumonia patients; 1 M. tetrag	5
Culture from ulcer	2
Blood examined for pernicious anemia	1
Smallpox vaccinations	7
Pathological examinations:	
Tissues prepared and examined; 14 frozen	837
Autopsies, human	220
Autopsies, animal	45
Blood of chickens examined for parasites	31
Examination for yaws	1
Examination for Oriental sore	1
Rats examined; (mus. musculus, 12,386; mus. norvegicus, 2,088; mus. rattus, 2,257; mus. alexandrinus, 682)	17,413
Examination of hog viscera	1
Smears from pasture clearing employees for filariases (13 positive)	354
Smears from patients at Ancon Hospital, examined for filariases (9 positive)	102
Smears from patients at Santo Tomas, examined for filariases (5 positive)	368
Autopsies, fowls; 6 chickens; 6 turkeys	12
Examinations for filariases	425

General:	
Wassermann reactions	12,615
Antityphoid vaccinations	36
Smallpox vaccinations	15
Autogenous vaccines prepared	2
Blood smears examined for malaria (33 positive)	167
Blood smears examined for filaria (1 positive)	67
Animals examined for murrina (2 positive)	27
Spleens of cattle examined for anthrax (29 positive)	80
Blood films examined for malaria (7 positive)	29
Blood films examined for trypanosomes and piroplasms	41
Tissue and hide examined for anthrax (2 positive)	2
Water from cispate examined for anthrax	1
Blood films of cows (2 positive B. bigeminum)	4
Examination for yaws	1
Smears from prostitutes (451 Colon; 1,779 Panama)	2,976
Chemical examinations:	
Urines	149
Gastric contents	9
Oil	15
Flour	6
Alcohol	6
Cattle dip from Corozal farm	4
Chlorinated lime from Colon Hospital	1
Lime water from Balboa dispensary	1
Benzine from medical store	2
Paint remover from district quartermaster, Balboa Heights	1
Beverages from Health Office, Panama	8
Coins from paymaster, The Panama Canal	2
Soap	3
Ashes and flue dust from Balboa incinerator	2
Honey from Commissary Division	1
Sugar cane for J. A. Senter	1
Capsules for J. A. Finnie	1
Spinal fluids:	
Phenol test	265
Ammonium sulphate test	246
Butyric acid test	261
Collodial gold test	218
Toxological examination, autopsy No. 5212	1
Vinegar for Health Office, Panama	1
Lard, Commissary Division	1
Noti seed, Commissary Division	1
Brewer's grain, district quartermaster, Balboa Heights	1
Carbolic acid, sanitary inspector, Ancon	2
Metallic packing for Mechanical Division	1
Identification of powder for Lieutenant Jenkins, 33d Infantry	1
Butter for oleomargarine test, Commissary Division	2
Commercial potash	1
Liquor	1
Calculus, urinary	1
Iron, pig	1
Iron, cast	1
Ice cream	2
Gasoline	6
Bay rum	2
Pipe, lead	1
Milk, analysis	188
Drugs, analysis	8
Undertaking Department:	
Cremations	202
Embalmed	74
Buried at Corozal	156
Bodies shipped to the United States	43
Bodies sent to Panama	24
Bodies sent to Colon	8
Bodies sent to Gatun	6
Bodies sent to Monte Lirio	1
Bodies sent to Colombia	1
Bodies sent to Corinto	1

Entomological examinations:

Identification of mosquito larvæ (anopheles, 354; non-anopheles, 226)	614
Identification of mosquito adults (anopheles, 4,116; non-anopheles, 5,495)	11,643
Other arthropods determined (18 species)	90
Miscellaneous identifications	6
Mosquitoes examined for microfilaria	270

TABLE XXIV.—CONTAGIOUS AND INFECTIOUS DISEASES.

Reported during the year 1918.

	Panama.	Colon.	Canal Zone.	Non-resident.	Total.
Beriberi	2				2
Cancer	18	3	2		23
Chickenpox	65	10	26		101
Chancroids			1		1
Diphtheria	31	10	7		48
Dysentery	33	10	51	13	107
Gonococcus infection	82	135	435	37	689
Hookworm disease	1		12		13
Influenza	507	86	1,695		2,288
Leprosy	10		7		17
Malaria	50	71	1,085	199	1,405
Measles	165	60	284	3	512
Measles, German	4	2	3		9
Mumps	5	3	76	3	87
Meningitis, simple	2		1		3
Meningitis, epidemic, cerebrospinal	10	2	7		19
Meningitis, tuberculous	4				4
Meningitis, pneumococcus			2		2
Ophthalmia neonatorum		1	3		4
Pellagra	6		1		7
Pneumonia	91	58	82	14	245
Poliomyelitis	1		2		3
Relapsing fever		1			1
Smallpox	102	2		29	133
Syphilis	86	4	209	5	304
Scarlet fever	1				1
Typhoid fever	8	3	9		20
Tetanus	1				1
Tuberculosis	402	56	62	3	523
Whooping cough	17	13	72		102
Yaws	1				1

TABLE XXV.—REPORT OF ROUTINE SANITARY WORK PERFORMED IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

	Canal Zone.	Panama.	Colon.[1]
Linear yards of new ditches constructed	15,709	1,956	33,075
Linear yards of ditches maintained (average)	244,218	1,551,372	269,799
Acres of vegetation removed	2,163	487	2,381
Number of garbage cans emptied	96,056	.....	729,905
Cubic yards of garbage removed	.....	146,920	172,006
Square yards of streets cleaned	798	7,200,000	45,095,901
Square yards of alleys cleaned	.....	.....	5,926,825
Pit closets inspected	3,155	.....	1,546
Closets disinfected	3,316	.....	.....
Number of water containers treated	47,015	76,582	1,527,849
Number of mosquito-breeding places destroyed	3,780	2,680	1,160
Mosquitoes destroyed in dwellings:			
Anopheles	37,711	.....	10,360
Stegomyia	440	.....	.....
Culex	83,648	.....	14,819
Number of fly-breeding places destroyed	53	3,219	221
Number of rats destroyed	18,948	14,995	5,039
Private properties cleaned	.....	361	35,170
Number of notices served to abate nuisances	391	4,462	7,160
Convictions for violation of sanitary code	.....	616	26
Houses disinfected or fumigated	346	310	11
Square yards of pools oiled, average, monthly	482,523	606,777	1,376,460
Buildings inspected	29,818	89,803	136,353
Buildings, construction and repairs:			
Plans for new buildings approved	1	39	29
Permits issued to repair old buildings	.....	1,168	678
Buildings demolished	.....	10	.....
Buildings condemned	.....	107	6
Food inspection:			
Dairies, milk vendors, etc	6	570	35
Bakeries, ice cream parlors, etc	.....	415	1,156
Bottling works, saloons, etc	.....	117	1,623
Hotels, clubs, restaurants, etc	160	1,037	2,654
Markets, fruit stands, miscellaneous	746	443	6,978
Material used during year:			
Crude oil ..... gallons	47,713	14,298	272,784
Larvacide ..... gallons	6,750	3,583	1,962
Kerosene ..... gallons	3,958	1,400	.....

[1] Includes Cristobal and Mount Hope, Canal Zone.

TABLE XXVI.—CONSOLIDATED REPORT OF QUARANTINE TRANSACTIONS AT THE PORTS OF BALBOA-PANAMA AND COLON-CRISTOBAL.

Vessels inspected and passed	2,788
Vessels held in quarantine	90
Vessels inspected and transiting Canal in quarantine	102
Vessels passed on medical officer's certificate	25
Total vessels entered	3,005
Supplemental inspections of detained vessels	109
Supplemental inspections of vessels at docks	890
Vessels fumigated on arrival	165
Vessels fumigated prior to departure	16
Bills of health issued	2,177
Bills of health viséed	1,920
Crew inspected on arrival	139,933
Passengers inspected on arrival	33,923
Total persons inspected on arrival	173,856
Crew passed on medical officer's certificate	36,747
Supplemental inspection of passengers and crew	17,500
Persons vaccinated in port on arrival	2,437
Persons vaccinated in port of departure or en route	9,100
Total number of persons vaccinated	11,537
Persons detained at quarantine stations to complete period of incubation of yellow fever and bubonic plague	3,613
Persons held in quarantine on board vessels	15,496
Total persons detained in quarantine	19,109
Passengers in transit passing through the Canal	20,190
Passengers in transit for Pacific ports not passing through Canal on arriving vessels	2,172
Passengers in transit for Atlantic ports	2,782
Immigrants rejected and deported	401

BOCAS DEL TORO.

Number of vessels inspected and passed	329
Number of crew inspected and passed	8,913
Number of passengers inspected and passed	2,349
Number of passengers, transit, inspected and passed	3,239

TABLE XXVII.—IMMIGRATION REPORT FOR THE PORTS OF BALBOA-PANAMA AND COLON-CRISTOBAL.

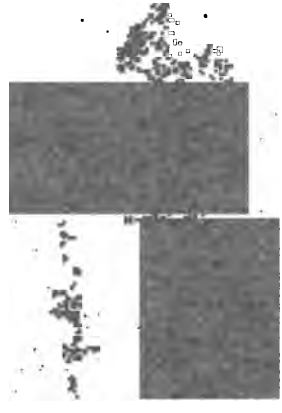
	Cabin.	Steerage.
United States	5,630	2,359
Europe	77	14
Cuba	109	113
Porto Rico	234	1,497
West Indies (not shown above)	281	994
Costa Rica	125	71
Bocas del Toro, Republic of Panama	343	2,734
Salvador	5	1
Guatemala	11	2
Nicaragua	38	5
Honduras	4	
Mexico	1	1
Colombia	602	735
Venezuela	102	14
Peru	34	18
Ecuador	31	16
Chile	22	3
China and Japan	20	29
Total	7,765	10,227
Grand total		17,992

TABLE XXVIII.—PERSONNEL REPORT.

(Average number of employees at work during the year.)

	1918.	1917.	December 31, 1918.		
			Gold.	Silver.	Total.
Chief health office	4	3	5		5
Medical storehouse	9	8	4	5	9
Quarantine service	48	48	11	36	47
Health office, Panama	158	147	15	144	159
Health office, Colon	155	160	14	142	156
Ancon Hospital	338	330	122	220	342
Colon Hospital	50	44	17	32	49
Santo Tomas Hospital	6	6	6		6
Palo Seco Leper Asylum	34	27	2	32	34
Zone sanitation	168	134	5	163	168
Corozal Hospital and farm	114	123	15	105	120
Dispensaries.					
Balboa	9	9	5	4	9
Gamboa[1]	2	1			
Gatun	4	4	2	2	4
Paraiso[1]	5	4			
Pedro Miguel	5	4	3	2	5
Total	1,109	1,052	226	887	1,113

[1] Gamboa and Paraiso dispensaries discontinued during the year, 1918.



REPORT

OF THE

HEALTH DEPARTMENT

OF

THE PANAMA CANAL

FOR THE

CALENDAR YEAR

1919

H. C. FISHER

Colonel, Medical Corps, United States Army
Chief Health Officer

THE PANAMA CANAL PRESS
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1920

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THE PANAMA CANAL

HEALTH DEPARTMENT

Operating under the direction of the Governor of The Panama Canal. Maintained from funds designated for sanitation in Panama Canal appropriations and revenues derived from its own operations. It exercises jurisdiction in health matters over the Canal Zone and the cities of Panama and Colon, Republic of Panama, and also cooperates with the Panamanian Government in health matters in other parts of the Republic.

LETTER OF TRANSMITTAL.

THE PANAMA CANAL,
HEALTH DEPARTMENT,
BALBOA HEIGHTS, C. Z., *April 28, 1920.*

Col. CHESTER HARDING,
Governor, The Panama Canal.
Balboa Heights, Canal Zone.

SIR: I have the honor to submit the following report of the operations of the health department for the year 1919.

Respectfully,
H. C. FISHER,
Chief Health Officer.

HEALTH DEPARTMENT.

ORGANIZATION AND OPERATION.

The organization of the health department consists of:

Division of Hospitals and Charities—
- Ancon Hospital, Ancon.
- Colon Hospital, Colon.
- Corozal Hospital, Corozal.
- Santo Tomas Hospital, Panama, R. P.
- Palo Seco Leper Asylum, Palo Seco.
- Dispensaries at—
  - Colon Hospital.
  - Gatun.
  - Pedro Miguel.
  - Ancon Hospital.
  - Balboa.
- District Dentists at—
  - Colon.
  - Gatun.
  - Pedro Miguel.
  - Ancon.
  - Balboa.
  - La Boca.
- Medical Storehouse, Ancon.

Division of Sanitation—
- Health Office, Panama.
- Health Office, Colon.
- Chief Sanitary Inspector, Canal Zone, Balboa Heights.
  - District Sanitary Inspectors at—
    - Gatun.
    - Pedro Miguel.
    - Ancon.
    - Balboa.

Division of Quarantine—
- Chief Quarantine Office, Balboa Heights.
- Quarantine Station, Colon.
- Quarantine Station, Fort Amador.
- Quarantine Station, Bocas del Toro.

PERSONNEL.

(December 31, 1919.)

Executive Office.

Balboa Heights.

Col. H. C. Fisher, U. S. Army, Chief Health Officer.[1]
Dr. D. P. Curry, Assistant Chief Health Officer.

[1] Lieut. Col. A. T. McCormack, Chief Health Officer, was relieved from du January 23, 1919, by War Department orders, and Maj. R. L. Loughran, sup intendent of Ancon Hospital, was made Acting Chief Health Officer pending t arrival of Col. H. C. Fisher, who was appointed Chief Health Officer effecti March 31, 1919.

DIVISION OF HOSPITALS AND CHARITIES.

Ancon Hospital.

Col. L. T. Hess, U. S. Army, Superintendent.
Dr. T. W. Earhart, Chief of Surgical Clinic.
Dr. W. E. Hubbard, Assistant Chief of Surgical Clinic.
Dr. R. C. Connor, Chief of Medical Clinic.
Dr. W. W. Braithwaite, Assistant Chief of Medical Clinic.
Dr. A. F. Ryan, Chief of Eye and Ear Clinic.
Dr. L. S. Townsend, Chief of X-Ray Clinic.

Physicians.

Dr. George Eugene.
Dr. H. G. Hambleton.
Dr. C. M. Pounders.
Dr. P. J. Connor
Dr. N. B. Kupfer.
Dr. C. D. Briscoe.
Dr. H. K. Tuttle.
Dr. P. C. Pomeroy.

Internes.

Dr. R. R. Hannon.
Dr. J. A. Smart.
Dr. K. H. Bailey.
Dr. James Burrow.
Dr. Geo. O. Bassett.
Dr. L. S. Chapman.

Colon Hospital.

Lieut.-Col. Guy L. Qualls, U. S. A., Superintendent.

Physicians.

Dr. W. V. Levy.
Dr. W. W. Cook.
Dr. J. C. Scott.
Dr. B. A. Credille.

Internes.

Dr. David Rosenberg.
Dr. H. M. Kanner.

Santo Tomas Hospital (Panama).

Maj. E. A. Bocock, U. S. A., Superintendent.

Physicians on Panama Canal Roll.

Dr. J. S. Vance.
Dr. C. C. Phillips.

Board of Health Laboratory.

Dr. L. B. Bates, Chief of Laboratory.
Dr. H. C. Clark, Pathologist.
Lieut. J. H. St. John, U. S. Army, Bacteriologist.
Mr. J. E. Jacob, Chemist.
Mr. James Zetek, Entomologist.

Corozal Hospital.

Dr. Louis Wender, Superintendent.

Physicians.

Dr. D. G. O'Neil.
Dr. D. G. Sampson.

DISPENSARIES.

Colon.

Dr. Wm. V. Levy, District Physician.

Gatun.

Dr. J. A. Grider, District Physician.

Pedro Miguel.

Dr. Wm. B. Meares, District Physician.
Dr. F. W. Pirkey.

Balboa.

Dr. I. E. Hix, District Physician.
Dr. W. C. Gibson.
Dr. L. O. Keen.
Dr. D. L. Hollis.

Ancon.

Dr. W. K. Olson, District Physician.
Dr. H. G. Bickford.

DIVISION OF SANITATION.

Panama Health Office.

Dr. Henry Goldthwaite, Health Officer.

J. M. Carprow, Sanitary Inspector.
O. W. Searcy, Sanitary Inspector.
C. L. Pierce, Sanitary Inspector.
N. C. Anderson, Sanitary Inspector.
V. A. E. Norman, Sanitary Inspector.
W. S. Chidester, Sanitary Inspector.
B. C. Quinby, Building Inspector.
Dr. F. T. Eisenman, Veterinarian and Meat Inspector.

Colon Health Office.

Dr. J. L. Byrd, Health Officer.

C. H. Bath, Sanitary Inspector.
T. A. Leathley, Sanitary Inspector.
J. E. Johnson, Sanitary Inspector.
Emil Becker, Sanitary Inspector.
Gus Frank, Sanitary Inspector.
W. G. Abendroth, Sanitary Inspector.
M. M. Seeley, Sanitary Inspector.
E. K. Turner, Sanitary Inspector.
Dr. I. C. Mattatall, Supervising Veterinarian and Meat Inspector.
Dr. W. F. Gross, Veterinarian and Meat Inspector.
Dr. F. F. Dowd, Veterinarian and Meat Inspector.

CANAL ZONE.

(Vacant), Chief Sanitary Inspector.
E. F. Quimby, Sanitary Inspector, Gatun District.
I. W. Pickett, Sanitary Inspector, Pedro Miguel District.
J. L. Tolar, Assistant Sanitary Inspector, Pedro Miguel District.
Geo. L. Willett, Sanitary Inspector, Ancon-Corozal District.
J. P. Corrigan, Sanitary Inspector, Balboa District.
Geo. Campbell, Sanitary Inspector (Relief).

DIVISION OF QUARANTINE.

Surgeon S. B. Grubbs, U. S. P. H. S., Chief Quarantine Officer, Balboa Heights, C. Z.

Cristobal-Colon Quarantine, Cristobal, C. Z.

Dr. C. A. Hearne, Quarantine Officer.
Dr. E. T. Lake.
Dr. J. C. Hubbard.
Dr. J. D. Odom.

Balboa-Panama Quarantine, Fort Amador, C. Z.

Dr. H. C. Watts, Quarantine Officer.
Dr. A. B. Toppan.

Bocas del Toro.

Dr. W. J. Burke, Quarantine Officer.

Palo Seco Leper Asylum.

Mr. F. D. Tucker, Superintendent.

HOSPITALS AND CHARITIES.

Ancon Hospital has a capacity for 849 patients, and is the parent hospital of the system. It serves principally employees of The Panama Canal and their families, the Army and Navy garrisons on the Isthmus, charity patients from the Canal Zone, and shipping; it, as well as all other Panama Canal hospitals, is open to the public and many patients from South and Central America are admitted. It is operated as a general hospital for medical and surgical treatment, is thoroughly equipped for diagnostic service. It conforms to the best hospital practice in equipment, maintaining X-ray, eye and ear, medical, and surgical clinics.

The Board of Health Laboratory does work for all hospitals, dispensaries, Post Surgeons of the Army, and private hospitals and physicians; also, entomological work for the Division of Sanitation, and the Supply Department. It adjoins Ancon Hospital and is operated in close connection with it. This laboratory is thoroughly equipped with departments of bacteriology, pathology, chemistry, and entomology. Detailed statements of its activities are given on page 49 of this report.

Colon Hospital, on the Atlantic side, is in the Republic of Panama, but was constructed and is maintained entirely by The Panama Canal. Upon request of the Alcalde, charity patients from Colon are admitted to this hospital. Primarily it is designed for emergency cases incapable of being transferred to Ancon Hospital, its capacity being limited to 80 patients.

Corozal Hospital, for the insane, is located at Corozal, 3 miles from Panama. The hospital wards occupy an area of about 5 acres, and include 10 ward buildings for the insane. The management of this hospital also includes that of the farm of 150 acres, 30 cultivated and 120 pasture, on which the hospital is located. This institution operates a piggery, and a dairy of approximately 60 cows, furnishing milk for hospitals, and some for the small children in the Canal Zone and for adults on physician's prescriptions. In addition, a home for cripples injured in the service of The Panama Canal is provided and operated under the hospital management.

Santo Tomas Hospital, located in the city of Panama, is owned by the Government of Panama, but is administered jointly by that Government and the health department of The Panama Canal. It is a general hospital for the treatment of Panamanian citizens. It is well equipped for both medical and surgical treatment, and supplied with all standard modern facilities. The salaries of only the American superintendent, two physicians, one chief nurse and two nurses, are paid from Panama Canal funds.

Dispensaries are provided at Colon, Gatun, Pedro Miguel, Balboa, and Ancon. To each is attached a district physician, with assistant physicians where necessary; the surgical and other equipment of the dispensaries is adequate for all treatment of patients whose condition does not necessitate hospital care. The Colon and Ancon dispensaries serve as admitting offices for the hospitals. The outpatient service for employees is also covered by dispensary physicians.

Palo Seco Leper Asylum is situated within the Canal Zone area, but at an isolated point of the Pacific Coast, approximately 4 miles from Balboa. Patients from both the Canal Zone and the Republic of Panama are admitted, the latter chargeable to the Panamanian Government for their care and treatment. A small area of land is cultivated by some of the patients that are physically able to work, and it is endeavored to make their existence as comfortable in every way as possible. The necessary medical attention is supplied by physicians of the health department. For administrative purposes this institution is placed under the supervision of the Chief Quarantine Officer.

District dentists are located at points most convenient of access to employees. They receive no salary, but are given office space and furniture, and other privileges of Canal employees, and are restricted as to the scale of charges they may make to employees.

The Medical Storehouse at Ancon purchases through the Washington Office and distributes to all hospitals and dispensaries medical and surgical supplies and equipment. It also makes sales of such supplies to ships calling at or transiting the Canal.

SANITATION.

Sanitation in the Canal Zone embraces ordinary health policing with especial stress upon the work of mosquito elimination and destruction. In the cities of Panama and Colon it embraces sanitary policing, street cleaning, garbage collection, food inspection, and building inspection. The inspection of food animals and their pasturage, slaughter and storage of their products, is done by this division.

QUARANTINE.

The quarantine division is charged with the enforcement of the quarantine and immigration regulations of the Canal Zone and of the Republic of Panama. It operates at each of the Canal terminals—Cristobal and Balboa; a branch is also established at Bocas del Toro, a port on the Atlantic Coast of the Republic, on account of its proximity to the Canal. The peculiar situation of the Canal as a gateway between those countries of the South and Far East in which contagious diseases are prevalent, and those of the temperate zones, renders rigid quarantine at the Isthmus imperative, but constant endeavor is being made to eliminate restrictions and delays whenever possible due to cleaning up of adjacent countries or to additional knowledge regarding quarantinable diseases.

VITAL STATISTICS.[2]

EMPLOYEES.

The average number of employees on the rolls of The Panama Canal and the Panama Railroad, for the year was 24,204, as compared with 25,520 for 1918, and 32,589 for 1917.

[2]All morbidity and mortality rates are computed as equivalent annual per 1,000.

The total admission rates to hospitals and quarters was 550.21 as compared with 405.67 in 1918, and 356.75 in 1917. For disease alone the admission rate to hospitals was 176.09, as compared with 136.60 in 1918, and 124.80 in 1917. The total admission rate to hospitals only was 210.92, as compared with 163.17 in 1918, and 160.85 in 1917. (*See* Chart No. 1.)

The total death rate was 7.23 as against 8.11 in 1918, 7.09 in 1917, 6.03 in 1916, 5.77 in 1915, and 7.04 in 1914. The death rate from disease alone was 6.20, as against 7.13 in 1918, and 5.74 in 1917. (*See* Chart No. 2.)

The constantly noneffective rate from all causes was 14.29, as compared with 11.02 for 1918, and 9.65 for 1917. (*See* Chart No. 3.)

The admission rate for malaria, to both hospitals and quarters, was 31.07, as compared with 18.55 for 1918, and 14.51 for 1917. The noneffective rate for malaria was 3.99, as compared with 1.13 for 1918, and 0.48 for 1917. (*See* Charts Nos. 4, 5, and 6.)

The admission rate for typhoid fever was 0.17, as compared with 0.24 for 1918, and 0.18 in 1917, and 0.66 in 1916. No deaths from typhoid fever among employees occurred during the year.

The five diseases causing the highest number of hospital admissions with their rates were as follows:

	1918.		1919.	
	Admissions.	Rate.	Admissions.	Rate.
Malaria	434	17 01	678	28.01
Venereal diseases	381	14.93	540	22 31
Influenza	553	21.67	305	12 60
Diseases of the eyes and their annexa	99	3 88	194	8 02
Tuberculosis	96	3.76	81	3 34

The five diseases causing the highest number of deaths, with their rates, were as follows:

	1918.		1919.	
	Deaths.	Rate.	Deaths.	Rate.
Tuberculosis (various organs)	46	1.80	23	0.95
Nephritis (acute and chronic)	19	.74	21	.87
Pneumonia (broncho and lobar)	33	1.29	19	.78
Organic diseases of the heart	16	.63	18	.74
Cerebral hemorrhage	6	.24	10	.41

EFFECTS OF RACE.

The admission rate to hospitals and death rate from disease, for white employees, was 252.27, and 1.77, as compared with 158.58 and 7.21 for black employees.

The admission rate to hospitals and quarters for malaria was 24.33 for white employees, as compared with 32.59 for black employees.

The death rate from disease for Americans was 1.08, as compared with 3.38 in 1918.

Canal Zone.

EMPLOYEES AND NONEMPLOYEES.

From the average population of 26,511 in the Canal Zone, there was a total of 229 deaths during the year. During the first 6 months of this period military population was not included. Starting July 1, 1919, military population is included in statistics of the Canal Zone. Of these, 207 deaths were from disease, giving a rate of 7.81 as compared with 9.69 for 1918, and 9.91 for 1917.

The death rate for tuberculosis was 0.83, as compared with 1.84 for 1918. Deaths from tuberculosis this year were 10 per cent of all deaths.

There were 695 births reported during the year, giving a birth rate of 26.22. Of these 242 were white and 453 black.

There were 79 deaths which occurred among children under 1 year of age, 9 white and 70 black, giving an infant mortality rate, based on the number of births reported for the year, of 37.23 for white and 154.53 for black children, with a general average of 113.67 per 1,000 births.

Of the total deaths, 34 per cent occurred among children under 1 year of age, and 49 per cent among children under 5 years of age.

Of the total births reported, 5 per cent were stillbirths.

Below is a table showing the death rates for the Canal Zone, from 1905 to 1919, inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	23,463	828	35.29	1913	61,700	1,047	16.97
1906	34,095	1,700	49.86	1914	46,379	710	15.31
1907	54,036	1,708	31.60	1915	31,946	410	12.83
1908	67,146	1,273	18.95	1916	31,447	343	10.91
1909	76,900	1,025	13.33	1917	27,543	313	11.36
1910	86,465	1,251	14.47	1918	22,290	236	10.59
1911	90,434	1,385	15.32	1919	26,511	229	8.64
1912	79,279	1,129	14.24				

Average population, excluding military population for last six months of 1917, the year 1918 and for the first six months of 1919.

Panama City.

EMPLOYEES AND NONEMPLOYEES.

The population of the city, as shown by the health department census of June, 1917, is 61,369.

From a population of 61,369, there was a total of 1,211 deaths during the year. Of these 1,165 were from disease, giving a rate of 18.98, *as compared with 20.92 for* 1918, and 27.19 for 1917.

The principal causes of death, as compared with last year, were as follows:

	1918.	1919.
Tuberculosis (various organs)	254	241
Pneumonia (broncho and lobar)	146	171
Diarrhea and enteritis (including colitis)	165	132
Nephritis (acute and chronic)	90	84
Cerebral hemorrhage (apoplexy)	27	39

The death rate from tuberculosis was 3.93, as compared with 4.14 for 1918, being 20 per cent of the total deaths this year, as compared with 19 per cent for 1918.

There were 2,214 births reported during the year, giving a birth rate of 36.08.

There were 342 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported for the year, of 154.47.

Of the total deaths, 28 per cent occurred among children under 1 year of age, and 39 per cent among children under 5 years of age.

Of the total births reported, 6 per cent were stillbirths.

Below is a table showing the death rate in Panama City from 1905 to 1919, inclusive, including deaths from all causes among both employees and nonemployees.

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	21,984	1,447	65.82	1913	47,172	1,507	31.95
1906	25,518	1,142	44.75	1914	53,948	1,863	34.53
1907	33,548	1,156	34.45	1915	60,373	1,810	29.98
1908	37,073	1,292	34.83	1916	60,778	1,765	29.04
1909	40,801	1,038	25.44	1917	61,074	1,714	28.06
1910	45,591	1,446	31.72	1918	61,369	1,314	21.41
1911	46,555	1,456	31.27	1919	61,369	1,211	19.74
1912	47,057	1,380	29.33				

COLON.

EMPLOYEES AND NONEMPLOYEES.

From an average population of 26,078, a total number of 573 deaths occurred during the year. Of these, 536 were from disease, giving a rate of 20.55 from disease alone, as compared with 22.51 for 1918 and 25.29 for 1917.

The principal causes of deaths, as compared with last year, were as follows:

	1918.	1919.
Tuberculosis (various organs)	116	101
Pneumonia (broncho and lobar)	91	74
Nephritis (acute and chronic)	45	56
Diarrhea and enteritis (including colitis)	54	55
Organic diseases of the heart	41	46

The death rate from tuberculosis was 3.87, as compared with 4.45 for 1918, being 18 per cent of the deaths this year, as compared with 19 per cent for 1918.

There were 908 births reported during the year, giving a birth rate of 34.82.

There were 141 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported for the year of 155.29.

Of the total deaths, 25 per cent occurred among children under 1 year of age, and 36 per cent among children under 5 years of age.

Of the total births reported, 6 per cent were stillbirths.

Below is a table showing the death rate in Colon from 1905 to 1919, inclusive, including deaths from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year	Population.	Deaths.	Rate per 1,000.
1905	11,176	553	49 48	1913	20,232	489	24 17
1906	13,651	703	51 42	1914	23,265	590	25 36
1907	14,549	571	39 24	1915	29,331	640	21 82
1908	15,878	418	26 32	1916	24,693	696	28 19
1909	17,479	396	22 65	1917	25,386	667	26 27
1910	19,535	514	26 31	1918	26,078	616	23 62
1911	19,947	527	26 42	1919	26,078	573	21 97
1912	20,174	493	24 44				

GENERAL REMARKS.

Malaria.—The admission rate for malaria for the year was higher than it had been since 1915 (see chart IV). A rapid rise in the rate occurred in July; and for the week ending July 12, the annual admission rate of employees with malaria was 137.8 per thousand, the latter half of the month showing as sharp a decline as a result of energetic measures of control. The heaviest infection was on the Atlantic side of the Isthmus. Varying climatic conditions doubtless account for some of the variation in the malaria incidence, but it is impossible to determine exactly the primary causes behind all of the conditions that are observed as affecting the rate.

In May of this year there occurred a strike of the silver laborers of the Panama Railroad dock at Cristobal and large numbers of natives were brought in from unsanitated areas of Panama to fill their places. These are notoriously chronic malaria carriers. At the same time undrained swamps in the neighborhood of Colon, Cristobal, and Gatun began to give off unusual swarms of *Anopheles albimanus* and *tarsimaculata*. The screens of the Washington Hotel and Colon Hospital were so thickly covered with these mosquitoes that a larvacide spray was used repeatedly as the easiest way of destroying the invaders. In the town of New Cristobal they were also numerous. There was no *Anopheles* breeding nearer than the Margarita road swamp—nearly 2 miles by direct flight from the hotel and a mile and a half from New Cristobal, with about a mile of open water of Manzanillo Bay intervening; there is very little doubt

that flight took place over this distance from the swamp to the points mentioned. To have come from any other breeding place they would have had to fly a greater distance or over the full length of Colon and Cristobal, the intermediate parts of which were free from *Anopheles*. (See map, frontispiece.) The prevailing winds at this season are variable and light.

The laborers' settlement of Camp Bierd, the coaling plant, and the dry dock, all south of Cristobal, were also heavily infected and *Anopheles* were found to be coming in great numbers from the swamps of Telfer's Island, and the vicinity of Mount Hope. Sea-level ditches were placed in these swamps so as to drain the territory within a mile of the dry dock and all dairy cattle were removed beyond that area.

The Army sanitary inspector made sea-level ditches in the Margarita swamp, draining into the bay and into Coco Solo River, so that fresh water no longer gathers there and the tides reach practically all parts of it. It has been proposed to fill this swamp by suction dredges, pumping spoil from the sea at an estimated cost of nearly a million dollars, thus entirely correcting this troublesome area and doing away with its costly maintenance and at the same time making available for use a valuable tract of land.

A high *Anopheles* prevalence and increased malaria rate was manifested at Gatun at the beginning of the wet season and observations showed that enormous flights of mosquitoes were coming across the Canal from a swamp formed by damming of water between the Chagres River dike and the spoil of the French canal, making a swamp nearly a square mile in area, the greater portion of it within a mile of Gatun Locks. Experiments made by the former Chief Sanitary Inspector, Mr. Le Prince, in 1913, demonstrated flights from this swamp at a time when spoil was being pumped into it by suction dredges, but because of the nearly flat slope and luxuriant vegetation that established itself and the tremendous precipitation of the rainy season, the swampy condition reappeared so that *Anopheles* breeding again became prolific. In July of this year work was begun by putting a large ditch through the west part of this swamp, with laterals toward the Canal at about 500-foot intervals and now no water is to be found there, except as its furthermost, northern extremity. The results obtained can not be fully determined until another wet season is experienced.

Other swamps in the vicinity of Mindi were drained and the continuity of the old French east diversion from Boca Mindi to the Canal was restored by long ditches, connecting the interrupted portions through a culvert under the railroad.

At Pedro Miguel extensive work was begun in the Rio Grande River valley and in the fortification clearings formerly used as cattle pastures. Owing to the difficulty of controling *Anopheles* breeding in cattle pastures it has been found necessary to insist more strictly upon observance of the rule promulgated in 1916 that no cattle pastures be permitted within a mile of sanitated settlements.

In the Ancon-Corozal district the outlying areas requiring maintenance by oiling and other temporary measures are being put in better condition by the construction of open ditches lined with

rete sectional half-round drains or by the installation of rock-red concrete tile. It has been found that precast concrete drains far cheaper than clay tile, and are equally satisfactory for all purposes and it is planned that the health department manu-ure all its own concrete tile at the larvacide plant, Ancon.

he Army post and the hospital at Corozal furnished most of the aria in this district. In connection with the construction of the Army camp (Fort Clayton) at Miraflores, the surface of the denas River, a prolific *Anopheles* producer, has been lowered 7 by tunnelling under the floor of the concrete railroad and wagon ge, admitting every tide and allowing the river to reduce to a small stream between tides. Several large ponds also were ned or controlled in this area; the sanitation of Corozal profits eby, as all these breeding places were close enough for flights into residence section.

he Balboa district required no extensive construction during the , but the large hydraulic fill north of town demands an increasing unt of attention because of unequal settling, and also because of ecoming grassed over, which holds and conceals the water of the y season and allows it to seep out at the margins of grassy spots s to produce sufficient moisture on the surface for breeding. hes dug in the material are rapidly obliterated by the rains; the contours change with settling; so no permanent work can as be attempted for its control. A new fill, just completed, between boa and Corozal, and the Canal and railroad, has settled and ked extensively so that some trouble is anticipated from this area he next wet season.

wo large Army posts, of permanent concrete construction, have n begun on the Isthmus, and will be completed by late summer 920. Each will accommodate a full regiment of infantry and both require an extension of our sanitated areas to protect their soldier ulations.

ort Clayton, at Miraflores, on the Pacific side, presents no unusual ures of sanitation. The Cardenas River will have to be "trained" ome distance above the post and there will appear the usual small ams, springs, and seepage areas to be controlled.

ort Davis, at Gatun, is not so well situated, being in close prox-y to large, flat, swampy areas, in which cattle are pastured, so quite extensive and expensive work should be done before sol-s are stationed here. From some of the nearby pastures the cattle t be removed and their hoof prints eliminated by filling or grading. as been found impossible in our wet seasons, frequently even in p hill land, to drain pastures so that they will not be punched up he feet of cattle. These hoof prints are always favorite breeding es for *Anopheles* and to control them effectively by oil is im-ticable and costly because of the difficulty of searching out and ing every one of them.

attle camp malaria.—In spite of the administration of quinine in rain doses each night to such employees of the cattle pasture ring camps as will accept it, the malaria rate of these camps con-es high. They are largely recruited from the natives of the

Republic of Panama, the greater number of whom are probably chronic carriers of the malaria organism. Because of their ignorant state it is very hard to get them to cooperate in prophylactic measures, so that quinine administration has never had a fair trial of its efficiency. Living in temporary, open, thatched bunk houses, on the banks of lagoons and streams, as they hew out clearings in the virgin jungle where little sanitation is feasible, they are continually exposed to attack by hordes of mosquitoes. The best solution of the problem seems to lie in providing suitably screened buildings, of a knock-down or portable type if necessary, and a more routine administration of quinine as a prophylactic.

The accompanying table shows the number of employees treated for malaria during the year.

The cattle clearing industry employs its maximum number in the dry season when the malaria incidence elsewhere is low; and at no time is there more than a small fraction of the total number of Panama Canal employees engaged in this work. The average total number of Panama Canal employees was 24 204, of whom an average of less than 1,000 were employed at pasture clearing during the year. Were it possible to figure a rate per thousand on this shifting population the figures would show an enormously high rate for the pasture clearing gangs as compared with the comparatively low rate of the rest of the Zone:

REPORT OF MALARIA CASES FOR THE YEAR 1919 (employees only).

	Canal Zone.			Outside Canal Zone.			Total.
	Sanitated areas.	Cattle camps and plantations.	Miscellaneous, outside of sanitated areas.	City of Colon.	City of Panama.	Outside of sanitated areas.	
First quarter (dry season)	28	182	3	6	9	6	234
Second quarter (beginning of wet season)	69	50	8	11	9	14	161
Third quarter (middle of wet season)	119	32	6	48	36	20	261
Fourth quarter (end of wet season)	20	37	4	5	8	22	96
Total number of cases	236	301	21	70	62	62	752

Every case of malaria is reported in detail by the physician as soon as he makes a diagnosis and these reports are the basis of our study of the malaria rate and incidence for which the health department considers itself responsible. Copies of this report go to the following:

1. The Chief Health Officer.

2 and 3. The health officer of the city or the sanitary inspector of the district in which the patient lives and the one in which he works.

4. The district physician who will administer the "follow-up" treatment after discharge from hospital.

Every case report is closely scrutizined and the information thereon is analyzed in an endeavor to determine as nearly as possible just where the infection was contracted.

A number of interesting problems of malaria control continue to present themselves, and in some respects the method of solution departs from that which obtained in previous years. When *Anopheles* swarmed from relatively near-by propagation areas it was considered a matter of the greatest importance that all grass and other vegetation be kept cut for a distance of several hundred yards from quarters so as to reduce shelter in which mosquitoes could harbor from wind and rain, and at one time all grass cutting was charged to sanitation. Following the completion of the Canal in 1914, attention could be directed against breeding places more remotely situated, so that now the more important residence and industrial centers are in relatively mosquito-free areas and the health department now removes only such vegetation as may be favoring mosquito *breeding*, such as grow along the banks of and obstructs sanitary ditches and trained streams or in marshy spots. While the lawns of Canal Zone settlements are beautifully kept, this work is now done by the quartermaster's department for the sake of appearance and vines and shrubbery are used extensively in adorning the grounds, except in "silver"[1] settlements, where it is feared they might serve to conceal containers or other rubbish. Nor do we longer attempt to burn vegetation from ditches by an oil spray as was once done. With the increased cost of oil and labor, this process proved too slow and costly and our present plan is to use the precast sectional, half round concrete drain shown in a report for 1918, or, better still when possible, cylindrical concrete drains covered with broken rock, so that an occasional cutting of grass at the side of open drains is all that is necessary.

Some earthen ditches still remain not concreted for various reasons, and these, from frequent cleanings out, have assumed a wide, shallow form that renders them difficult to maintain free from larvæ without much use of oil. At present the men are instructed to clean only the central portion of a spade's width, throwing the dirt so removed into the angles at the sides, thus preserving as much as possible the original width of the ditch. Trimming the sides at each cleaning so as to present a neat appearance of uniform width is not only unnecessary, but, in the long run, destroys the usefulness of the ditch.

The results observed in draining several small swamps have demonstrated the importance of a careful investigation for the *source* of the water that is to be removed. Where an area is found to be under water this can not always be done without first removing the surface water by a central ditch and possibly one or more laterals; but when it comes to putting in drainage of a permanent form it must first be determined if the water present is from run-off or from seepage, or if it is of the deep-seated variety, rather common in this region of former geological disturbance, where the source is a spring, emerging along an upturned strata or dike, whose catchment area may be relatively far away in higher lands. These "springs" form large, rather circumscribed, areas of boggy ground that may be recognized by the great depth to which the muck penetrates and the fact that one, standing on the turf covering, can rock and shake the whole area like a bowl of jelly.

[1] The "silver" employees are mostly colored aliens whose maximum wage is $80 U. S. currency a month.

The centrally located ditch and laterals may control rainfall and run-off; a "band ditch" of sufficient depth takes care of simple seepage where the water exudes from above an outcrop of impervious strata; but in the case of the deeper form of spring described above no universal rule can apply. If low ground is available nearby, a deep tile and rock lined ditch through the center of the "pipe" may be used to keep water from coming to the surface. Sometimes it may be necessary to use a band ditch in addition, or even to fill in above the bog so as to raise the surface of the ground above the water level. In some cases a deep sump is dug in the center, in which are sunk headless barrels, one below the other, and filled with broken stone, while a tile lateral conducts the water that rises in them to a near-by drain.

Where only a small amount of seepage water is to be handled for short distances it is found satisfactory to install rock-filled ditches without the use of the tile, laying the stone at the bottom of the ditch so as to leave as open a channel as possible.

Typhoid fever.—There were 32 cases of typhoid fever, of whom 8 died. Eleven were admitted from ships and could not have contracted the disease here. Each of the cases developing in the resident population was carefully investigated with a view to learning its source. Stools from the balance of the family or other intimate associates were examined and three carriers were detected, one of whom left the country and the other two received instructions from the health department as to precautions to be taken. They will be kept under observation. Several patients gave histories of eating raw shell fish from the sewage polluted waters of Panama Bay. At no time did the disease prevail in epidemic form and it is suspected that unrecognized carriers are responsible for most of those that occurred.

Influenza.—There were 645 cases of influenza reported from the Canal Zone and adjacent territory. No Americans died from this disease and but four deaths occurred—one from Panama, one from Jamaica, and two nonresidents from Colombia. Although influenza is repeatedly introduced into the Zone, it appears not to develop in as virulent a form among the majority of those attacked here as it does among a similar class in the States.

Pneumonia continues to be one of the chief causes of death, especially in the densely populated sections of Panama and Colon, where, in spite of efforts to improve ventilation and lighting, many employees are herded together in entirely inadequate quarters. It is a matter of frequent comment by Canal Zone physicians that sickness is far less prevalent in the modern, well-planned Canal quarters than among employees living in the tenements of the two cities.

A few of the older Government-owned quarters for laborers on the Zone share with Colon and Panama tenements the reproach of being unfit for habitation, they also being of poor construction, badly lighted and ventilated, unscreened and much overcrowded. There is a real, pressing necessity for more quarters of the right kind for our "silver" employees, such as are provided at La Boca on the Pacific side, Red Tank at Pedro Miguel, and Silver City (now building) at Cristobal. La Boca, especially, is a model town of its kind, with wide, well-

Plate 1.—La Boca. At the Pacific entrance to the Panama Canal is this model settlement for its "silver" employees, with wide, well-paved streets, lawns, and planting spaces, screened houses with modern plumbing, school, churches, commissary, and restaurant. (*See* page 20.)

paved streets, planting spaces and lawns, screened houses, with modern plumbing, and a well-supplied commissary and restaurant. By constant supervision and training the colored population of this city has been given an education in sanitation that is evidenced in their appearance and surroundings and which could well be emulated by people of a relatively higher social strata and culture.

Another effort on the part of The Panama Canal to improve living conditions for its laborers, especially those whose employment is of a temporary nature, is seen in the reopening of a portion of the Zone to unemployed, able-bodied men, who are given quarters and a generous portion of land to cultivate, in return for which a nominal rent is paid and the tenant obligates himself to work for the Panama Canal a stated portion of the year, if called upon, at the regular rate of pay for labor of the kind he performs. The old town of Las Cascadas, on the west bank of the Canal, since construction days and until recently used as an Army post, has been assigned for this purpose, as here are already available quite a number of houses and an adequate water supply. If the unemployed negro can be induced to take advantage of this proposition, it will help solve one of our most difficult problems—that of providing a reservoir of labor for emergency use that will be self-supporting between periods of employment.

Where it is possible to do so, employees living in regular Zone settlements are encouraged to engage in gardening outside of working hours, and adjacent tracts of land are designated for this purpose. As drainage operations advance, more and more ground is made available for cultivation and it is hoped that ultimately every family that so desires may have their own garden spot where a greater part of their food can be grown.

Tuberculosis.—The highest death rate of the Isthmus is still due to tuberculosis, to which disease also applies what has been said of pneumonia. In recent years a reduction in the number of cases is apparent, but no radical improvement in this condition may be expected until the housing situation is materially improved, adequate hospitalization facilities provided, and a comprehensive campaign of education and prophylaxis developed for the terminal cities as well as the Canal Zone.

Venereal diseases.—The situation regarding venereal diseases remains unchanged save for the establishment of a free venereal disease clinic at Santo Tomas Hospital in Panama, where both curative and prophylactic treatments are given. It is proposed to institute similar measures in Colon, provided funds for the work can be obtained.

The following report of the Chief Health Officer to the Governor dated November 25, 1919, is of interest in this connection:

"About 3 months ago a small group of officials of The Panama Canal and of the United States Army met with several public spirited citizens of the Republic of Panama to consider what steps could be taken to control the ravages of venereal diseases.

The standard program approved by the War Department was presented and adopted as the plan of effort.

It was fully realized that the centers of prostitution and disease are in the cities of Panama and Colon, outside the jurisdiction of the

United States officials, so that it is necessary to secure the cooperation of the Panama Government for the passage of proper laws and their enforcement.

It was determined that a campaign of education should be pushed and all possible provision be made for the medical care of venereal disease cases. Accordingly, the moving pictures "Fit to Win" and "The End of the Road" are being extensively shown both in the Canal Zone and in Panama. Such literature as is available is being distributed, and arrangement is being made to have certain pamphlets translated into Spanish for distribution. The local newspapers gave the campaign a great deal of sympathetic interest and an encouraging amount of educational work is in progress. A very successful free clinic for venereal diseases has been made possible by provision of funds by the Republic of Panama. It is expected to establish a free clinic in Colon in the near future, the National Red Cross having provided the necessary funds.[4]

On September 27, 1919, a meeting was held in the assembly room of the National Institute of Panama, for the purpose of stating conditions and discussing plans for combating venereal diseases on the Isthmus. This meeting was attended by the Governor of The Panama Canal and other officials, and by representatives of the United States Army, together with the President of the Republic of Panama, his cabinet officers, other high officials of the Republic, and representative Panamanian citizens.

The prevalence of venereal disease was forcibly represented, and the approved program of attack as carried out in the United States was presented. The discussion was general and upon motion of the Secretary of Foreign Relations of the Republic of Panama, the meeting unanimously approved the suggested program.

However, as yet conditions in Panama and Colon remain basically unchanged. The standard forms of laws for the repression of prostitution and control of venereal diseases as compiled by the Commission on Training Camp Activities of the War and Navy Departments, were long ago submitted to the officials of the Panamanian Government upon their request, but they have not seen fit to pass any laws modeled upon them.

Prostitutes are numerous in the two terminal cities. The incidence of venereal disease is very high in this portion of the world, and the existing conditions are deplorably unsatisfactory.

The health department is powerless to control the high incidence of venereal disease without the cooperation of Panamanian authorities able and willing to pass and enforce proper laws for its control. It is furthermore hampered by lack of funds to finance the expenses of a vigorous campaign.

The Panamanian authorities seem to hesitate to take the positive steps that were so successfully taken by our own authorities in the United States at the outbreak of the World War."

Smallpox.—The mild epidemic of smallpox in the latter half of 1918 gradually subsided and but 65 cases, all of a benign type with no deaths, were reported in 1919. Systematic vaccination was con-

[4] Opened March 1, 1920.

tinued in the cities of Panama and Colon. Upon receipt of reports of the disease in near-by interior towns, a vaccinator was sent to the suspected places and, if the disease was verified, vaccination was performed on all contacts and nonimmunes that could be reached.

Yellow fever.—There have been no cases of yellow fever originating on the Isthmus since 1905.

Two cases were brought in during the year; one an Englishman, chief engineer of a steamship, who contracted the disease at Guayaquil, Ecuador; the other an Australian lad en route home from Nicaragua where the infection was received; both died.

Measles, chicken pox, whooping cough, and diphtheria are prevalent on the Isthmus. The 10 deaths recorded from the latter disease can be attributed to neglect on the part of ignorant parents who failed to present the patients for treatment in time for it to be effective.

Infant mortality.—While apparently decreasing, the infant mortality is still high. Several factors contribute to this high rate, chiefly ignorance and poverty, and the hygienic and dietic errors that accompany these. Children of white American parentage living in the Zone do exceptionally well. An adequate supply of fresh milk is our greatest need in providing for children, as the Government-owned dairies of Mindi and Corozal are unable to meet the Zone demand, nor do the privately operated dairies of Panama and Colon supply the needs of those cities. All Zone milk is regularly pasteurized and steps are under way to accomplish this same end in Panama City and Colon.

Rats and anti-plague work.—Because of the presence of plague in both North and South American ports, the possibility of its introduction here is ever borne in mind.

Systematic rat catching is done in the terminal cities, by poison and by traps, and all rats and mice caught or found dead (if not too badly decomposed) are sent to the Board of Health laboratory for autopsy. No plague infection has been found in any of these.

Building regulations require thorough rat-proofing of all new construction, and where extensive repairs are made upon an old building. Rats are numerous in the jungles and pastures of the Isthmus and it is realized that our best safeguard—in addition to quarantine measures (q. v.)—lies in building the rat out of inhabited sections.

Fly breeding.—Unremitting diligence is exercised to keep the Canal Zone as free from flies as possible. Whenever flies are noticeably present a search is at once instituted for their source—usually with success. Through years of experience some of the sanitary employees have developed an instinct or intuition that directs them to obscure breeding places. A large proportion of the ships arriving at these ports have fly breeding aboard them. Horse manure continues to be the chief source of house flies and many attempts have been made to devise some economical way of treating the manure so as to conserve its fertilizing value without producing flies. Composting in pits alone does not make the manure fly proof. In properly constructed and protected pits the primary infection (which occurs here immediately after the dropping of the manure) is entirely killed in a few days. Prolonged retention in the pit may render it somewhat

less attractive than fresh manure to the flies, but it has been definitely shown that manure composted even as long as 6 months in a tight receptacle will become fly blown on exposure.

The method now in use is to remove the manure from the pits at any time it may be needed after 15 days' composting, mixing it thoroughly with an equal quantity of fresh earth, and spreading at once upon the ground or using as a top dressing 3 inches thick. No fly breeding is found in manure so treated. Some of the Chinese gardeners use borax with success but they require constant watching to insure its proper application.

PANAMA HEALTH OFFICE.

Malaria.—The following table shows the cases of malaria chargeable to the city of Panama for the years 1914 to 1919, inclusive:

Year.	
1914	2,154
1915	614
1916	235
1917	187
1918	97
1919	181

No reason is given for the increase in cases reported during the year 1919, as a twice-a-week inspection of all ditches and pools failed to reveal any *anopheline* larvæ over 72 hours old; showing plainly, however, that there was an influx of adult anopheles. It is possible, and probable, that the adults may have flown in from the Sabanas district as we do not sanitate beyond the Tumba Muerta road line, one mile from the city proper.

Many unnecessary drains have been eliminated by filling, others straightened, and many low spots have been filled in. These measures should cause a marked reduction in the future use of oil and in the ditching and drainage force.

To repeat what has been said in two previous annual reports, the serious problem confronting us regarding malaria is that portion of the environment of the city of Panama known as Las Sabanas. The northern portion of the city, or that which is generally known as the Calidonia district, can probably not be kept entirely free from malaria as long as the Sabanas country remains unsanitated.

Tuberculosis.—The number of deaths from tuberculosis for the years of 1914 to 1919, inclusive, are as follows:

Year.	
1914	229
1915	245
1916	313
1917	348
1918	254
1919	241

In the annual report for the year of 1918 it was stated that it was interesting to note from the table of deaths from this disease that the decrease had probably been affected by the work of this office regarding housing conditions and it is gratifying to note the continued decrease during the current year. It is to be hoped that with the continued work of the building inspector in improving housing conditions that a reduction will again be shown in the next annual report.

Infant mortality.—The following shows the annual death rate for the years of 1914 to 1919, inclusive:

Rate per thousand.

Year.	Rate.
1914	272
1915	221
1916	236.86
1917	237.73
1918	188.27
1919	154.47

The improved housing conditions have undoubtedly been responsible for the material decrease, together with the baby welfare work done under the auspices of the Panama Red Cross.

Veterinary work.—The fees collected as the result of the work of the veterinarian attached to this office amounted to $4,154.10. This sum includes fees for the inspection of cattle and swine, and the supervision of disinfection of hides and skins.

During the coming year, there will be two veterinarians attached to this office, so as to divide the work, one doing meat inspection entirely and the other devoting his attention to milk and food inspections.

Dogs.—The catching of vagrant dogs was discontinued for the reason that the work was not entirely under our control, the health office paying for the work done and the municipality doing as they pleased regarding the animals. During the coming year, however, under an agreement with the present Alcalde, this office will assume entire charge of the catching of dogs and their disposal, which should materially abate the present nuisance.

Flies.—We have instituted a system of tri-weekly larvaciding of all stables in Panama, in addition to placing fly paper therein. A fine is imposed upon all persons on whose premises flies are found breeding. We manufacture all fly paper used in stables and also use the same sticky mixture on wires in the city market. This method we have found most successful and much cheaper than purchasing the commercial fly paper. The city is remarkably free from flies at all times.

Milk and dairies.—A most gratifying change has been made in the handling of milk in Panama; with the employment of a competent milk inspector by this office, the milk situation was found to be such that some drastic action was necessary. The many milk producers were finally persuaded to employ a dairyman to supervise their output, and to devise some scheme whereby they could amalgamate and have a central station.

On October 15, 1919, notice was given to all milk producers that on and after January 1, 1920, all milk offered for sale in the city of Panama, or its environs, must be pasteurized and delivered to the consumer in sanitary milk bottles. The milk dealers got together, formed an association, have rented a proper building, and, about the 1st of January, 1920, will install a pasteurizer capable of caring for the entire present and immediate future milk supply. When the contemplated milk regulations are enforced Panama will have a supply of milk the equal in quality of that sold anywhere.

In this connection, it is pertinent to note that, under the supervision of this practical dairyman, the supply of milk has increased about 40 per cent. Three new dairy barns have been completed, 4 are in course of construction, 3 are being reconstructed, and 2 old barns have been abandoned.

Garbage collection and disposal and street cleaning.—The increase in garbage necessitated the shifting of our day garbage truck to the night shift and, as this report is written, the four night trucks do not take care of the garbage within the 8-hour period. During the year, the amount of garbage has largely increased, and it will not be long before it will be necessary to put on an additional night truck.

Since the last report was made, we have built concrete compost pits which are proving fairly satisfactory; all manure is delivered to the pits without expense to us and the composted product is sold at a profit.

Venereal prophylaxis.—Acting under Decree No. 12 of June 28, 1918, this office during the present year was instrumental in having a large number of women sent to Santo Tomas Hospital for examination for venereal disease. Of this number, 1,057 were detained for treatment.

Negotiations are now being made with the Panama Government for the deportation of a large number of prostitutes of foreign birth.

COLON-CRISTOBAL HEALTH OFFICE.

Infant mortality.—The following table shows a gratifying decrease in the infant mortality rate of Colon:

Infant mortality death rates per 1,000 births.

Year.	Rate.
1914	194
1915	224
1916	228
1917	248
1918	168
1919	155

Infant welfare work is now being done by a trained nurse attached to this office, and this, with the better economic conditions resulting from an increase in rates of pay for the laboring classes, and also the systematic examination of midwives, should make for continued progress toward a lower infant death rate. New "silver" quarters are being built at Mount Hope which will tend to relieve the congested condition in Colon tenements and generally to raise the sanitary level of the "silver" employee and his family.

Malaria.—The sudden increase in the malaria rate of the district in June and July of this year was the signal for an energetic campaign that resulted in a gratifyingly quick return to a normal rate. Routine general administration of quinine was at once begun in the foci of infection, carriers of the organism were sought for, and extensive ditching operations begun in outlying areas from which the *Anopheles* were swarming. (*See also* under General Remarks *and* Charts Nos. 7 and 8.)

Garbage disposal.—The insanitary and unsightly garbage dump that had been maintained on 9th Street, Colon, was abandoned in October and all containers thereon destroyed, it having been found impossible

to successfully burn garbage in this way during our wet season. A small rail incinerator that would prove very good and economical for garbage disposal in a smaller town is being operated with little fly breeding. A contract has been placed for a modern incinerator, similar to that at Balboa, to be erected in 1920.

Street sweeping.—Resurfacing of the streets in Colon would greatly facilitate street sweeping in this city, as it is difficult to keep rough-surfaced streets properly cleaned at all times.

The health office discontinued cleaning alleyways and patios in Colon in October and the property owners are now required to have them cleaned and maintained in proper sanitary condition.

Mount Hope Cemetery.—Many improvements are being made at Mount Hope Cemetery. The entrance road is being concreted and shrubbery and flowers are being arranged in an orderly manner. With the completion of the improvements contemplated during this dry season, Mount Hope will begin to have the general appearance that a Government cemetery should have.

Building inspection.—Twelve permits for new buildings were issued in 1919 and the value of those now being erected is about $200,000. By Panamanian law every new building erected in the city of Colon must be of concrete and the health department insists upon thorough rat-proofing of all new construction and extensive repairs. The health office maintains supervision of all tenements and requires adequate repairs to be made when they are needed. No new building may be occupied until the building inspector pronounces it complete and a permit to occupy is given.

Measures for control of rats.—The destruction of old wooden piers of the Panama Railroad and other steamship lines and the remodeling of the old cold storage plant of The Panama Canal into a warehouse have eliminated large rat-harboring places. Especial attention is given to the storage of materials, especially foodstuffs, so as to facilitate inspection and rat destruction and to provide the least possible means for rat shelter or propagation. Wherever possible everything is piled on especially constructed racks, which are about 5 feet wide and 12 to 18 inches from the floor, with an aisle of 20 inches between racks. The floor space is kept clean.

The broken concrete and other rubbish left from the fire of 1915 were found to be havens for rats and the property owners were required to remove or level off this material. Freight cars of the Panama Railroad are all being rat-proofed. Garbage cans are provided with close-fitting covers and every effort is made to reduce food supplies for rodents to a minimum. Street rubbish cans have a round hole 6 inches in diameter cut in the cover so that trash can be placed in them without removing the top.

Dairy inspection.—A tuberculin test (thermal) was given all dairy cattle at Mindi dairy during December, 1919. There were no positive reactions. Owing to the high bacteria count of the Sheffield farm milk, shipped frozen from the States, it was considered advisable to have it repasteurized after arrival on the Zone. On recommendation from this office all milk sold or handled by the Commissary Division is being pasteurized before distribution.

Meat inspection.—The abattoir and cold storage plant of The Panama- Canal at Mount Hope was completed during the year. It is a modern, sanitary plant in every way and has excellent facilities for meat inspection. The new abattoir of the city of Colon was also completed and put in operation during the year. Health department inspectors have charge of meat inspection of both plants.

Meat inspection as conducted in the Canal Zone and Colon is more thorough and complete than required by the Bureau of Animal Industry regulations. The latter regulations do not require the routine microscopic examination of splenic smears, whereas here a smear is examined microscopically on each animal slaughtered at Mount Hope and Colon abattoirs; by this method several incipient cases of anthrax were discovered that did not have post-mortem lesions detectable by the unaided eye.

Since the opening of the new Colon abattoir and the establishment of meat inspection there, they have found it necessary to increase the daily kill from 15 to 25 per day in order to supply the demand.

Shortly after the Cattle Industry of the Supply Department began importing cattle from Colombia in 1915, anthrax made its appearance on the Canal Zone. The first year only a few cases occurred, but the number of cases have increased rapidly from year to year until at present we have an epidemic of anthrax on the Canal Zone during each dry season, losing from 100 to 300 head each year from this disease alone. Practically all the cases have occurred during the dry season or from December to April each year, and it seems to disappear during the wet season. Practically all pasturage on the Canal Zone is infected, for deaths have been reported from nearly all cattle industry pastures.

Complete and thorough inspection, including ante-mortem, post-mortem, and microscopic inspections, is our main reliance at present.

Report of veterinary work:

Quarantine Inspection:	
Cattle	34,023
Hogs	11,700
Ante and post mortem inspection:	
Cattle	29,223
Hogs	11,534
Calves	124
Goats	61
Condemned:	
Cattle carcasses	25
Cattle carcasses, parts	3,381
Hog carcasses	158
Calves carcasses	61
Hog carcasses passed for sterilization	402

Three anthrax cases were found in cattle at the abattoir, 1 in January, 1 in March, and 1 in December. The cases in January and December died in abattoir pens and the case in March was discovered on post-mortem examination.

During the year, 5,670,463 pounds of meat was certified for export; under our supervision was prepared for local consumption approximately 5,000,000 pounds of beef and beef products, 1,500,000 pounds of pork and 550,000 pounds of sausage.

DIVISION OF QUARANTINE.

The quarantine regulations of both the United States and the Canal Zone direct precautions against six diseases only—the so-called major epidemic diseases, viz:

Cholera.
Yellow fever.
Smallpox.
Typhus fever.
Leprosy.
Plague.

Of these leprosy is chronic, and our knowledge of the way it is transmitted or how it may be cured has not changed materially since Biblical times. Owing to its repulsive symptoms and baffling nature the disease continues to inspire a fear of contagion that is not warranted. Lepers should not be allowed to travel and the ordinary quarantine inspection readily stops any well-marked cases that may attempt to do so. The mild case, however, is detected with difficulty, and quarantine is powerless to stop it. Fortunately, the segregation of lepers now enforced by all advanced governments is gradually eradicating the disease.

The remaining five diseases have in the past been the scourges of mankind, causing deaths by thousands and even millions.

Cholera seems to be ever present in Asia, has frequently invaded Europe, and has several times entered the United States. It is transmitted in a manner similar to typhoid fever; namely, by the ingestion of infected body discharges, and, considering the typhoid fever statistics of the United States, could easily prove very serious if it once gained a foothold. Fortunately, the Western Hemisphere is now free from the disease; the incubation period is only 5 days and all infected places many days distant. The practical danger is from carriers, which may be readily handled by laboratory methods. In addition, the supervision of water and food products on the Canal Zone is a protection against the spread of the disease even if a carrier should be allowed to land, which is entirely possible.

Yellow fever has been the epidemic scourge of North and South America, but from the standpoint of preventive medicine is a disease of the past, as has been demonstrated by the results on the Canal Zone and elsewhere. The discovery that the disease is transmitted by a certain kind of mosquito has allowed us to stop its importation and to render a district free from danger of spread of the disease even if cases were introduced from without. As is well known, the *Aedes calopus* does not propagate in the northern ports of the United States, and at such ports no quarantine against yellow fever is maintained. It appears possible to reduce the prevalence of these mosquitoes on the Canal Zone at least to a point where an isolated case could be introduced without any reasonable danger of secondary cases appearing.

Smallpox is said to have caused one of every 10 deaths 200 years ago, but is now easily controlled by vaccination. Cases occurring on vessels are easily handled, but more could be done by requiring proof of vaccination or immunity from everyone transiting the Canal, as well as those intending to remain, which is the present procedure.

Typhus fever is transmitted by the body louse, *Pediculosis vestimenti* or *corporis*. The disease is epidemic in Mexico, the Balkan states and eastern Asia, and has been spread by the war all over southern Europe. In addition cases have been reported in ports of Chile, Colombia, and Brazil. The war has brought the louse problem into prominence, as in addition to typhus this insect has been convicted of transmitting trench fever, and because the irritation and pyodermias caused by the lice detract from military efficiency. Anti-louse methods have improved during the past 2 years, and it is believed typhus fever will be rapidly reduced as normal conditions are restored. The incubation period for this disease is 12 days and it is possible for passengers to reach the Zone from many infected places within this time. Fortunately for us, lice do not thrive in a continued warm climate, and they are rarely found in this part of Panama except in the jails. They are undoubtedly more common in the higher altitudes, and, although the introduction of isolated cases of typhus fever would not be serious, the entire elimination of lice here is advisable.

Plague has the most terrible history of all epidemic diseases. It is the "black death" that periodically swept over the world during the middle ages, at one time killing a fourth of all human beings. Within the past 15 years the exact method of its spread has been determined, and while the control of the disease presents unusual difficulties we may act against it with confidence.

Bubonic plague is not transmitted from one human being to another, the authorities agree, but from rats to man through an intermediary, the flea. In fact it is primarily a rat disease, the human cases being the terminal stages of the rat epizootic. All methods, both to prevent the extension of the disease from one country to another and to eliminate the disease when once started, should be directed against the rat.

We are at present in the midst of another great pandemic of plague that began over 30 years ago—a pandemic that would now be causing an enormous mortality except for improved sanitation and disease control.

Rats are great travelers and it is difficult to prevent them from going from one country to another, as all ships, unless regularly and well fumigated, carry numbers of them. Rats may also be carried in any freight which affords them opportunities to hide or nest. It is difficult to kill rats in a ship unless it is empty and has been prepared by opening up limbers, pipe casing, and all other spaces in which rats may enter to escape the fumigating gas and by getting rid of accumulations of trash and dunnage, a remarkably small quantity of which will allow rats to survive even a strong fumigation. (See reprint No. 32, U. S. Public Health Reports, June 20, 1913.)

It is evident that, in addition to the protection afforded rats by freight, it is impossible to properly prepare a vessel for fumigation until it is entirely discharged, and that while theoretically a vessel should be fumigated as soon as it arrives from an infected or suspected port, this is of little value if the vessel is loaded. If the circumstances are extremely bad, the vessel may be discharged in the bay and then fumigated, but as a routine procedure this is not justified.

The best defense against the introduction of plague, therefore, is the periodic fumigation of vessels when entirely empty. This is recommended by the International Sanitary Convention, 1913 Article 26, as follows:

"Art. 26. It is recommended that vessels be periodically rid of their rats, the operation to take place at least once every six months. The health officer of the port in which the rat-ridding operation is performed shall deliver to the captain, owner, or agent, whenever request is made thereof, a certificate showing the date of the operation, the port where it was performed, and the method employed."

QUARANTINE METHODS AT THE CANAL ZONE.

Inspection.—This is required of all vessels from both United States and foreign ports. On April 1, 1919, the hours for boarding were extended on the Atlantic side from sundown to 10 p. m.; up to December 31, 117 ships had been inspected after sundown, an average of 13 per month. This means an average saving of 10 hours for each of these ships and is an important step in expediting shipping. The advisability of a similar night service at Balboa has been studied and has been recommended.

Influenza.—Late in 1918 a quarantine against influenza was instituted. It is difficult to exclude this disease, but a careful examination with detention of febrile cases has doubtless accomplished something, as although a great many cases of this disease have arrived there was no outbreak on the Isthmus.

Influenza among the troops on the Isthmus was very much less than during 1918. Figures furnished by the department surgeon show an admission rate of 31.6 with a noneffective rate of 0.68. There were approximately 5,000 troops on the Isthmus; the total admission from influenza was 161, with no deaths.

A notable case is that of the steamship *Tsurugisan Maru*, which arrived at Cristobal February 28, 1919, with 34 out of a crew of 54 sick with influenza. This ship was unable to proceed for two weeks, during which time 41 cases were removed, 30 for quarantine and 11 to the hospital. The vessel was cleaned throughout by scrubbing with water and larvacide.

Yellow fever.—All ports of Colombia, Ecuador, the northern part of Peru, Venezuela, Yucatan, and those of the western coast of Central America, are considered infected, and all passengers—except those who have previously had the disease—are required to be away from such ports 6 days before landing here, as well as passengers originating in clean ports near suspected localities whose whereabouts during the 5 days before sailing is not shown by certificate.

Vessels from suspected ports are fumigated at such ports, under supervision of U. S. Consuls, to kill mosquitoes, and are held on arrival at Canal ports to complete 6 days from the time fumigation is done, with daily examination of all persons, including taking of temperature. All persons whose temperature is above normal are isolated and if any symptoms of yellow fever appear the diagnostic board, consisting of the Chief Quarantine Officer, Chief of the Medical Clinic of Ancon Hospital, and Chief of the Board of Health Labora-

tory are asked to see the case. At Balboa 64 passengers were isolated and 6 were examined by the board. Two of these were definitely diagnosed as having yellow fever and died of the disease.

An additional safeguard which is operating with practically no delay to ships is the catching of mosquitoes on all vessels arriving from the yellow fever zones. This is done by two attendants armed with flashlights and killing bottles who spend two hours on each ship of average size. This method has been developed so successfully for houses, in the control of malaria on the Isthmus, that the results given below may be considered reliable and an indication of the value of the fumigation or ability of mosquitoes to remain on board vessels. Mosquito catching on vessels at Balboa, August 15 to December 31, 1919, was done as follows:

	Vessels fumigated at port of departure.	Vessels not fumigated.
From west coast, Central America	7	14
From Colombia	20	.....
From Ecuador	21	4
Total	48	18

Mosquitos found on vessels, to wit:

One from Colombia, 1 *Aedes calopus.*

One from Nicaragua, 1 *Anopheles albimanus*, 1 *Culex quinquefasciatus.*

Just what territory shall be considered infected or suspicious from a yellow fever standpoint is a difficult problem, and as it is seldom possible to obtain prompt information of the occurrence of first cases, it has been the custom to regard all near-by ports as suspected. It is admitted that this is a policy of extreme precaution that imposes considerable burden upon shipping and a loss upon some ports that are not necessary infected and the situation has long been studied with the idea of reducing delays without increasing the risk.

Two methods are available for the reduction of quarantine on account of yellow fever; *first*, to keep the Canal Zone and contiguous territory so free from *Aedes calopus* mosquitoes that yellow fever would have small means of spreading even were a case admitted, and the second, to provide some means of obtaining continuous and accurate information on sanitary conditions, especially regarding yellow fever, of all quarantined or suspected ports. Steps are being taken to ascertain whether the number of *Aedes calopus* in our terminal cities (*stegomyia* index), is kept below the danger point. During the month of December a complete *stegomyia* survey was made of the city of Colon under the direction of the local health officer and the quarantine physician, and a sample section of the city of Panama was similarly examined. The results were as follows:

	Containers with mosquito larvæ.	Containers with *stegomyia* larvæ.	Number of buildings inspected.	Number of lots inspected.	Per cent of houses breeding *stegomyia*.
Panama	11	11	153	.....	7.18
Colon	30	22	2,025	1,061	1.08

It is not possible to say to what figure the *stegomyia* index must be reduced in order to render the territory in question noninfectible to yellow fever, but repeated inspections will certainly enable us to keep below the danger point. In this connection the following communication from Dr. M. E. Connor in charge of the operations of the International Health Board in Guayaquil, Ecuador, is of interest: " * * * we had yellow fever controlled when the breeding in tanks had reduced to 10 per cent of the total in use and possibly eliminated when the percentage touched 5 per cent and practically certain when tank breeding places are kept as low as 2 per cent."

The *second* method presents the difficulties of additional expense, but if it will allow the modification of quarantine by imposing delay only where there is actual danger, the saving to shipping, the increase in trade and the encouragement of sanitary measures to get rid of yellow fever would, it is thought, pay for this expense many times over. The United States Public Health Service is interested and approves of this work and has agreed to furnish one commissioned officer; the International Health Board Commission working on the eradication of yellow fever states that such a plan would materially help their efforts, as a quick and sure reward in the nature of lessened or lifted quarantine—that will follow sanitary reform by the various localities—would stimulate the work everywhere.

A combination of the two methods mentioned, that is, a continuation of intensive antimosquito work accompanied by regular monthly stegomyia surveys as an index of results, and a constant supervision of near-by ports by representatives of The Panama Canal, would decrease the present danger and do much to eliminate the present costly and annoying delays. The methods recommended would not be unduly expensive, as the mosquito surveys, consisting of minute inspection of inhabited areas allow the inspector to more easily supervise the living conditions which must be watched at all times. The inspection of near-by ports would cost from $12,000 to $15,000 a year but a slight modfiication of quarantine delays to ships should result in increased business and tolls for the Canal.

During 1919 there were 80 vessels delayed in quarantine 173 days and 15,839 passengers were held 16,328 days. Any plan by which these delays may be reduced without sacrifice of protection to the Isthmus should be carefully considered.

In the future consideration of this problem the report of the financial losses—both direct or indirect—caused by quarantine at Canal ports will be considered. This report will be based on a study to be made by the Bureau of Statistics at the request of this department. So far as known no such investigation has ever been made and its conclusions should be of great interest to the sanitarian and to shipping.

Plague.—The procedure until May 1, 1919, has been to require all persons from ports where this disease existed among rats or human beings to be away from such ports 7 days before landing here; persons coming from Chile, Peru, and certain ports of Ecuador and

Venezuela were compelled to consume 7 days either on the trip or at quarantine. This procedure was changed to conform to the present scientific opinion that bubonic plague is transmitted to human beings only by plague-infected rats. Since May 1, 1919, no quarantine of human beings has been in force save under exceptional circumstances, and none is now contemplated. Under this procedure it is possible but extremely improbable that a person may be infected just before leaving for the Canal and become sick after landing. This, however, would be without consequence, although its occurrence doubtless might be attributed by the uninformed to faulty quarantine.

On the other hand, on April 1, 1919, the precautions against the importation of rats were increased by periodic fumigation, once in 3 months, of all vessels from the west coast of South America that make Cristobal their terminal port. These vessels come from a section of plague-infected ports, and it was previously the custom to fumigate the holds of the ships just before arriving at Balboa, using the ship's Clayton apparatus (a machine for extinguishing fires) for pumping sulphur dioxide fumes to various compartments of the ship. As the holds are always more or less full of cargo this fumigation was not effective; examination of such ships during discharge failed to reveal a single dead rat, but frequently showed live ones. The fumigation now being made when the ship is empty and after careful preparation is yielding an average of over 100 rats per ship for first fumigation and 10 per ship for subsequent fumigation. The report for Cristobal is as follows: First fumigation, 28 ships; rats recovered, 3,664. Subsequent fumigation, 22 ships; rats recovered, 224. In addition 27 vessels were fumigated for mosquitoes and other insects at Cristobal. At Balboa 15 vessels were fumigated for mosquitoes and one for rats. Sulphur dioxide is used for the most part but complete equipment for cyanide work has been supplied to each station and this is used for upper structures when advantageous. After fumigation a certificate is given which supplies accurate information as to the treatment of each part of the ship and the results obtained. This is in accord with the recommendation of the International Sanitary Convention previously quoted. (See page 31.)

The modified Aerothrust (Reprint U. S. Public Health Reports No. 428) is used in order to save time of vessels by promptly removing fumigating vapors, and gas masks are employed in order to be able to enter and open up compartments full of gases.

The procedure regarding freight coming from plague-infected ports has been modified. Produce that rats would eat was at one time prohibited except when accompanied by certificate stating that same had been stored in rat-proof warehouses or other required precautions had been taken. It is believed that the danger of introducing plague is greater from freight in which rats can nest or find protection than from rat food, and after ridding the ship of rats by periodic fumigation it was considered safe to remove all restrictions upon freight, on subsequent visits of the ship to the Canal, with the understanding that any articles such as crates, open baskets, etc., in which rats may harbor will be fumigated separately on arrival at Canal ports.

All vessels from suspected ports are still required to break off, to use rat guards, and to guard gangways and skids.

IMMIGRATION ISNPECTION.

The quarantine service is charged with the enforcement of the immigration laws of the Isthmus and of the Republic of Panama, aided in certain specific instances (American seamen and Chinese) by the Customs Bureau. A quarantine physician in the United States simply certifies as to the physical and mental state of the immigrant but here his financial condition and general desirability also must be decided by our physician.

While immigration, especially of the laboring class, has greatly decreased in recent years owing to the completion of the Panama Canal, the opening of the Canal and the consequent increasing number of vessels using it have brought additional duties to the quarantine officers in the handling of the many deserters who are a natural result of the Isthmus being the first stop in a long voyage.

On the arrival of a vessel the passenger list is examined and those who state that their coming to the Isthmus is merely one part of their journey, as well as those who signify that their wish is to make this place their home, are questioned as to their financial standing and then subjected to a medical examination, more or less elaborate according to circumstances.

The law requires all intending to become residents to be vaccinated; this is done if it has not already been successsully performed at the port of embarkation or en route. The passenger is rapidly scrutinized for any gross physical defects, examined particularly for trachoma, favus, and syphilis as well as the infectious diseases, and is asked a sufficient number of questions to form some judgment as to his mental condition.

Those about whom any suspicion exists are detained and subjected to more complete examination at the quarantine station. Those found deficient are refused admission. It is hoped that a change will be made regarding the decision by the United States Immigration authorities refusing entry into the United States of alien sailors previously removed from United States vessels at the Canal for medical treatment, notwithstanding their having been signed on at a United States port.

Deportations were as follows:

	Deserters or likely to become charges.	Public charges.	Prohibited aliens.	Undesirables.	Loathsome or dangerous contageous disease.	Stowaways.	Total.
Balboa	16	9	2	4	1	13	45
Cristobal	161	50	.....	78	1	13	303

PALO SECO LEPER ASYLUM.

At the suggestion of the Chief Quarantine Officer a committee, consisting of the Assistant Chief Health Officer, the Superintendent of Ancon Hospital and the Chief Quarantine Officer, was appointed to study the leprosy problem and especially the care of lepers at Palo Seco which receives *patients* from both the Canal Zone and the *Republic of Panama.*

The Committee reported in January, 1919, submitting recommendations which were in substance as follows:

1. The detection and isolation of lepers in the Republic of Panama should be more thorough, especial attention being given to the known foci of infection.

2. The Palo Seco reservation is well located, but the buildings should be transferred to the high plateau as soon as possible.

3. The reservation should be increased in size.

4. Definite plans providing for future expansion of approximately 10 per cent per annum should be drawn up and submitted to the Governor.

5. Employment should be provided for all patients able to work.

6. More articles, especially food, should be produced to make the institution more nearly self-supporting.

7. The present system of giving to patients clothing, tobacco, and other articles as needed should be discouraged and instead, better opportunities to earn money should be afforded, with a money allowance for those physically disabled.

8. Local coins should be furnished for use of patients, and all other money prohibited.

9. Patients should be allowed to marry legally if both are lepers and confined to the asylum. If already married and one is not a leper, such noninfected persons should be allowed to live with the leper husband or wife.

10. Self-government among patients should be encouraged in every way possible.

11. The diagnosis of leprosy, by which any person is confined to Palo Seco, should specify positive laboratory findings and give details of technique. This technique should be standard and the same in all cases. In addition, such cases should be passed upon by the diagnostic board consisting of the Chief Quarantine Officer, the Chief of the Medical Clinic of Ancon Hospital, and the Chief of the Board of Health Laboratory.

12. Upon recommendation of the above-mentioned diagnostic board, patients of the noninfective type (pure nerve cases) should be released, subject to examination not less than every 6 months. However, these patients should, when they so desire, be allowed to remain at the asylum or to return after release.

During the year all these recommendations have been largely put into effect except the moving of the buildings. The new site has been surveyed, however, and a wharf and road leading to it are about half completed.

The following comments on this work may be of interest:

Persons who are segregated on account of an extremely chronic disease such as leprosy should be considered primarily as inmates or citizens of a colony rather than patients. Formerly patients were well-cared for but were treated as paupers. That is they were given rations, board, medical treatment, and such other articles as were absolutely necessary, including tobacco. The incentive was to avoid possession, as everything was given, but only to supply urgent needs. This has been changed so that nothing is issued. Inmates are now

furnished meals, quarters, and laundry and a small money allowance based on physical condition. Patients have been divided into four classes— "A" being those in best physical condition, and "D" those who are practically helpless. "A" patients are given $1 per month, "B" $1.50, "C" $2, and "D" $2.50. The stock at the asylum store has been increased, and this operates independently, buying where advantageous and selling at a small profit. The patients' credit is good within limits but 50 per cent of all money coming to any patient either for allowance, work, or produce raised must go as credit to his account so long as he is in debt. All work on the station except in rare instances is done by patients who are paid by the hour according to physical condition and efficiency. Thus a patient with "A" physical and "A" efficiency gets 10 cents an hour, but if either physical or efficiency rating is "B" he can receive only 8 cents an hour. The man who can work gets more pay but less allowance, and the man who is physically handicapped gets less for the time he puts in because he does less but he gets a higher allowance per month. All work is voluntary, but now the incentive is to work and possess property and these make for contentment under all conditions.

The distinctive Palo Seco currency has now been in circulation several months. It has the advantage of preventing illegal purchases, especially liquor, preventing saving for escapes, and the use by the general population of money that has been handled by lepers. It may be noted here that a savings bank was also started in which there are many depositors.

The question of marriage which presented many difficulties has apparently been settled. It was recognized that the ideal of a contented village could never be attained if the opportunities for marriage or sex satisfaction were eliminated. On the other hand the idea of allowing lepers to marry is repugnant and all admit that children from such a union are undesirable. At present the right of patients to marry is recognized. One wedding has taken place and the husband has built a cottage for which material was furnished by the asylum. The whole station was interested in this marriage and the moral effect is good. The question of children was solved by a vasectomy done on the husband following his written request to that effect.

Interesting work for inmates still can be developed. Farm produce is coming in but we can do better. We are trying to teach better farming by means of the station garden, and we have goats and the best breeds of pigs. The ideal is to have the patients raise all the food consumed. Coffee, rice, sugar, tobacco, all remain to be tried. Meat production has just began. Vocational training especially to furnish employment to women and children is needed and this has been given an impetus by the visit and advice of Mrs. Clyde M. Myers, of the Mental Hygiene Society, who was at Corozal Hospital for 3 months as director of vocational therapy for the insane.

Early in the year the method of admission of lepers was changed so that all suspects are sent to Ancon Hospital for laboratory and clinical examinations. Positive cases must now be diagnosed by a board composed of the Chief of the Medical Clinic, Chief of the Laboratory, and the Chief Quarantine Officer.

In addition this board visited Palo Seco in June and July and the bacteriologist made many more visits and examined the records and physical condition of each patient with the view of securing uniform records of diagnoses, and with hope that certain cases might be sufficiently recovered to release without danger to the community. Certain cases after prolonged observation were diagnosed as nerve cases and the Chief Quarantine Officer was advised to make such disposition of these as seemed best.

Medical care of patients is given by a quarantine physician from the Balboa station who visits the asylum once a week and whenever called by the Superintendent.

For routine treatment Chaulmoogra Oil is given in capsules and practically all patients are taking it.

The religious and social service needs are cared for by Rev. H. R. Carson, Chaplain of Ancon Hospital, who also represents the International Society for the Care of Lepers, and by a priest designated by the Bishop of Panama.

On special occasions, especially Christmas, various organizations have made splendid efforts and contributions for the amusement of the colony.

The following is a report of patients:

Class of patients.	In asylum Jan. 1, 1919.	Admitted.	Died.	Discharged.	Remaining Dec. 31, 1919.
Panama pay	45	6	1	6	44
Zone charity	31	5		3	33
Total	76	11	1	9	77

ANCON HOSPITAL.

PERMANENT BUILDINGS.

Sections "C" and "D" were completed and turned over by the Building Division to the hospital and were immediately occupied by patients.

Section "C" houses all foreign white and colored male, medical, surgical, and eye and ear patients, except those suffering from tuberculosis and contagious diseases. The basement of one wing provides space for the linen room; the basement of the other wing for the property storeroom and paint shop.

Section "D" cares for all white and colored children, and all colored females, medical, surgical, obstetrical, and eye and ear patients, except those suffering from tuberculosis and contagious diseases. The basement of Section "D" is used as storeroom for undertaking supplies such as caskets, etc., and for other miscellaneous hospital equipment and material.

The Superintendent's quarters were completed in June and immediately occupied. (Plate 3.)

The foregoing mark the completion and occupancy of the authorized permanent buildings of Ancon Hospital. The buildings, con-

structed of reinforced concrete, are situated on the eastern slope of Ancon Hill from 150 to 175 feet above sea level and are modern in every respect as to layout, fixtures, equipment, and apparatus. (Plate 5.)

Administration-Clinics building.—This structure occupies a central location in the hospital plan, standing back from the main entrance stairway. It is three stories (and basement) in height, with twin towers, and by its location and size dominates the hospital group. The front approaches to the building are by broad sidewalks. At the rear, covered passageways radiate to other sections of the permanent hospital, sheltering patients and personnel from sun and rain going to and from operating rooms and clinics, and in the basement is located the pharmacy, clothes chute outlet, barber shop, attendants' locker room, and toilets, and miscellaneous storerooms. The general waiting room, the medical clinic, eye and ear clinic, and X-ray clinic are on the first floor. On the second floor is located the office of the Superintendent and clerical force, board room, library, and file room. (Plates 6 and 7.)

The entire third floor is occupied by the surgical clinic. The north wing contains four operating rooms in a line, opening onto a large corridor on the opposite side of which are storerooms for sterilized linen, auto-clave apparatus for hot and cold sterile water, distilled water, instrument and basin sterilizers, saline solution sterilizer, all electrically heated, sinks, etc., and surgeons' scrub-up room. The electrically operated elevator discharges patients and other passengers into the corridor convenient to operating rooms.

The central portion of the floor contains the anesthesia room, soiled linen room and chute, general waiting room, surgeons' lounging room, lockers, and baths, and attendants' quarters. The south wing contains the office of the Chief of Surgical Clinic, nurses' office, laboratory, examining rooms for men and women, nurses' rest room, emergency sterilizing room (steam), and emergency examining rooms.

Section "A"—This unit, situated to the right and front of the Administration-Clinics building, is a 2-story reinforced concrete structure, each floor having a large ward on each side of the central service section, the latter containing nurses' office, doctor's office, laboratory, cell, dining room, and kitchen, laboratories, baths, etc. In this section are treated all white male American medical, surgical, and eye and ear ward patients, excepting contagious diseases.

Section "B."—Situated to the left and front of the Administration-Clinics building, contains 40 private rooms, 7 small wards, 2 cells, and a complete maternity department, with central service section, and necessary service rooms to make it a complete unit. The building is two stories in height with basement. The equipment is modern in every respect. Section "B" cares for white female, medical, surgical, obstetrical, and eye and ear patients, white children, and white male private room patients.

Sections "C" and "D" are housed in a 3-story structure, with basement, located to the rear right side of the Administration-Clinics building. Each floor contains two pairs of wards on either side of a service section.

Section "C" is composed of large general wards, some for the care of all colored male patients and others for white foreign male patients. In Section "D," some of the wing floors are divided into two smaller wards to segregate different classes of patients; as, white and colored children (except new-born colored children which are cared for in the maternity ward). The maternity wards in Section "D" are for care of colored women. (Plates 8 and 9.)

Isolation section is a structure of three stories and basement, situated behind the Administration-Clinics building, to the left. It provides housing for all isolation cases, white and colored, and all cases of pulmonary tuberculosis. In the basement are located the attendants' rooms, receiving ward, nurses' and doctor's office, autoclave room, electric machinery room, etc. On the first floor are two 4-bed wards and 9 private rooms with all necessary service rooms. The second and third floors each have two 11-bed wards, 3 private rooms, and all necessary service rooms; dining room, kitchen, offices, examining rooms, etc. (Plate 10.)

The kitchen-mess halls building is located directly in rear of the Administration-Clinics building, and has two stories and basement. The main kitchen and silver dining room are located on the first floor. On the second floor are dining rooms for personnel and convalescents. (Plate 11.)

In the basement are located the electrically operated refrigerating plant, transformer room, and storage space for miscellaneous tools.

In rear of the kitchen-mess halls building is located an open structure housing the hospital power plant, and providing space for hospital carpenter and electrical shops.

BOARD OF HEALTH LABORATORY.

The laboratory is a 2-story reinforced concrete U-shaped building, enclosing a spacious courtyard. The main entrance is located in the center of the building. On the west side of this on ground floor is the clerk's office and filing room, the pamphlet room and the library; on the east side the main storeroom, a laboratory room, and the museum. On the second floor of the main building is the bacteriological laboratory, the bacteriological and Wasserman record room, the media room the sterilizing room, the pathological technician's room, and two rooms for the entomologist.

The ground floor of the east wing is occupied entirely by the embalming and undertaking department; viz., undertaker's office, refrigerator room, elevator, embalming room, storeroom and viewing room. The undertaker's apartment is connected with the crematory by a covered passageway. On the second floor of the east wing, over the undertaker's rooms, are the pathologist's laboratory, the autopsy room, and a general laboratory room, the use of which is temporarily loaned to the U. S. Department of Agriculture, Bureau of Entomology.

The ground floor of the west wing contains the chemical laboratory, the chemist's office and a chemical storeroom; on the second floor of this wing are located the director's office and laboratory, the photographic and dark rooms and a small bedroom. There is a basement with four rooms under the west wing, used for housing animals.

There is a large veranda on the courtyard side of the main building and both wings. Each laboratory room is well-lighted and provided with electricity for power and lights, water, steam, and gas. The floors of all rooms are tile and of the verandas concrete. (Plate 16.)

The *nurses' home*, three stories in height with a small service basement, occupies a site on the spur at the foot of the main stairway entrance to the hospital. It has 72 bedrooms and a suite for chief nurse, and contains a recreation hall. (Plate 12.)

Dispensary and admitting office.—This is a 2-story reinforced concrete building located on the hospital road a short distance below the main entrance to the hospital. The first floor provides space for offices for two physicians, waiting rooms for white and colored patients, admitting office, pharmacy laboratory, and examining room. The second floor contains quarters for personnel and two dental suites. (Plate 4.)

Garage.—The hospital garage is located in rear of the dispensary building. It has six stalls and workshop the width of two stalls, equipped with pit and necessary tools and apparatus to effect light running repairs.

BED CAPACITY.

	Present beds.	Emergency capacity.
Section "A" for white male ward patients:		
Ward 1, medical	44	55
Ward 2, medical and eye and ear	40	55
Ward 3, surgical (venereal)	44	55
Ward 4, surgical	40	55
Cells (2)	2	2
Private rooms (2)	2	2
Total	172	224
Section "B" (private rooms; obstetrical cases, white):		
Ward 5, white children ward, male	5	.....
Ward 5, small foreign ward	3	.....
Ward 5, private rooms, males, and cell	13	.....
Ward 6, white female children ward	5	.....
Ward 6, girls' ward	4	.....
Ward 6, female foreign ward	5	.....
Ward 6, private rooms	12	.....
Ward 7, white adult female ward	6	.....
Ward 7, 14 private rooms and cell, white female	17	.....
Ward 8, white surgical, female, and obstetrical	.....	.....
Ward 8, ward	7	.....
Ward 8, foreign ward	4	.....
Ward 8, seven private rooms (obstetrical)	7	.....
Ward 8, nursery	6	.....
Total	94	138
Section "C" for foreign white and colored, males:		
Ward 9, white foreign male; medical, surgical, eye and ear	36	46
Ward 10, black male, convalescent, medical and eye and ear	44	54
Ward 11, black male, acute surgical	38	48
Ward 12, black male, acute medical	40	54
Ward 13, black male, convalescent surgical	40	52
Ward 14	45	54
Cells (6)	12	12
Private rooms (9)	9	9
Total	264	338

BED CAPACITY—continued.

	Present beds.	Emergency capacity.
Section "D" for white and colored children; colored females:		
Ward 15	34	[illegible]
Ward 16	37	[illegible]
Ward 17, colored children	23	[illegible]
Ward 18, white children	20	[illegible]
Ward 19, colored female medical	40	[illegible]
Ward 20, colored female surgical and obstetrical	35	[illegible]
Cells (4)	2	[illegible]
Private rooms (8)	4	[illegible]
Total	195	[illegible]
Isolation:		
First floor, smallpox and lepers	18	[illegible]
Second floor, other contagious diseases	25	[illegible]
Third floor, tuberculosis women and contagious diseases	35	[illegible]
Fourth floor, tuberculosis men, white and black	35	[illegible]
Total	113	[illegible]
Grand total	838	[illegible]

CLINICS.

During the year 1,688 major operations and 5,813 minor operations were performed and 314 obstetrical cases were delivered in the surgical department; 3,519 visited the out-patient department.

There were 2,329 cases treated in the medical clinic out-patient department.

Eye and ear clinic.—Out-patient visits numbered 7,985; 1,263 refractions were made and 1,044 operations performed.

X-ray clinic.—There were 2,791 cases handled in the X-ray clinic; 6,961 plates and 955 dental films were taken, and 104 treatments given.

Motor transportation continued to meet hospital requirements efficiently at an average net cost per mile, including depreciation, of $0.1891. Due to the exclusive use of a light, inexpensive chassis, which was found better adapted to the requirements, the saving compared with cost of animal transportation is even greater than heretofore.

The "saving" from use of motor instead of animal transportation for the whole period in which motors have been used is $18,011.76. All cars were overhauled during the year and all are in good running condition. Two new Ford worm-drive truck chassis were received.

ROADS AND GROUNDS.

The noise of motor vehicles climbing the hill on the main hospital road occasioned so much disturbance to patients that it was found necessary to make the road open for down-hill traffic only under restrictions which ensure the minimum of noise.

Work of improving the grounds has continued during the year, considerable grading, sodding, and planting of shrubbery and trees having been accomplished.

[1] By use of cots approximately 1,400 patients could be cared for.

The usual routine repair and maintenance work was done during the year by hospital artisans. In addition a quantity of small equipment and furniture was manufactured with resultant economy to the department, and a number of minor building changes and additions were made. The principal items outside of routine are as follows:

Section "A."—Swinging doors fitted in corridors; sinks installed in ward dining rooms enclosed by partitions; card tables manufactured.

Section "B."—Ten rooms and 2 bathrooms repainted; basement locker rooms, showers, and toilets installed for use by colored male and female help of Sections "A" and "B."

Sections "C" and "D."—New food carts, tables, tray racks, and key boxes manufactured and installed; also bulletin boards.

Isolation section.—Dish washer installed; shelves, drain boards, and dish racks manufactured and installed; partitions placed on second and third floors.

Kitchen-mess halls building.—Concrete steps to road at orderlies' entrance; tables in main kitchen retopped; benches made for silver mess; sink and containers installed for coffee steamers.

Power plant.—New fire brick, steam valves, and burners installed, and boilers relagged.

Nurses' quarters.—Bulletin and desk boards manufactured; partition placed around transformer in basement.

Laboratory.—Mixing chamber, gas machine, installed; water lines to drinking fountains, and gas and water connections in chemical laboratory changed; manger and stall placed in basement; 150 cedar filing boxes and 18 vial racks made.

Miscellaneous.—New rear doors put on Administration-Clinics building; condemned linen bins made for linen room; 27 plain coffins made for undertaking department.

COMPARATIVE STATISTICS, ANCON AND COROZAL HOSPITALS.

	1919	1918	1917	1916	1915	1914	1913
Report of patient days	312,590	319,908	311,451	270,294	268,294	338,901	423,251
Cost of subsistence supplies per patient per day	0.3405	0.315	0.3369	0.2522	0.2372	0.253	0.217

	Total number treated.	Died.	Days treated.
Movement of patients, nonresidents of Canal Zone, Panama or Colon:			
Ancon Hospital, 1917	274	7	5,101
Corozal Hospital, 1917	76	3	21,396
Total	350	10	26,497
Ancon Hospital, 1918	510	9	7,667
Corozal Hospital, 1918	76	10	20,431
Total	586	19	28,089
Ancon Hospital, 1919	883	19	14,534
Corozal Hospital, 1919	56	3	17,245
Total	939	22	31,776

COMPARATIVE STATISTICS, ANCON AND COROZAL HOSPITALS—Continued.

	1919.	1918.	1917.	1916.	1915.
Chronic patients:					
Total number treated	34	38	63	52	58
Total number days treatment	9,710	8,603	9,836	9,174	9,801
Average number patients per day	27	26	27	25	26
Average per capita cost	0.2654	0.2602	0.2520	0.2400	0.2503
Movements of military patients (Ancon and Corozal hospitals):					
Total number of admissions	1,392	4,165	2,469	1,937	1,771
Total number of days relief	22,217	49,067	33,494	28,519	24,643
Number constantly sick	60.90	134.49	91.76	78.13	67.51
Admissions:					
To Ancon Hospital	10,503	12,153	10,880	9,116	.....
To Corozal Hospital	151	229	191	225	.....
To Chronics ward	8	13	45	26	.....
Cripples to farm	17	39	54	59	.....
Totals	10,679	12,436	11,170	9,426	.....
Deaths:					
Ancon Hospital	343	336	368	325	.....
Corozal Hospital	43	73	30	57	.....
Operations:					
Major surgical operations	1,688	1,784	1,684	1,465	.....
Minor surgical operations	5,813	4,424	1,775	1,333	.....
Eye and ear operations	1,044	1,088	855	622	.....
Refractions	1,263	1,312	1,108	1,378	.....
Obstetrical cases delivered	314	321	301	246	.....
Outpatient department:					
Total visits	13,883	14,276	11,784	13,888	.....
New cases	7,468	7,760	.....	.....	.....
Prescriptions written	5,424	4,230	3,798	6,289	.....
Dispensary (District Physician, Ancon):					
Total treated	102,034	92,201	142,200	130,219	.....

RECOMMENDATIONS.

For the purpose of remedying obvious deficiencies in the present hospital facilities as well as for providing for intelligent development of hospital activities in the future, the Superintendent strongly recommends the following:

1. Nearly all new hospital construction in the United States provides for hydro- and electro-therapeutic apparatus, and the need in the tropics is greater than in the temperate zone. Residence in the tropics induces nervous conditions which are amenable to hydro- and electro-therapeusis and the establishment of such a service in Ancon Hospital is recommended. Room therefor could be provided with small expense, excepting matter of equipment, in the basement of Administration-Clinics building.

2. The organization of a Urological-skin service, now under the surgical service, will enable the hospital to care more satisfactorily for venereal and skin cases which are not now, owing to the lack of anyone particularly qualified in genitourinary work, receiving the attention they should. This proposed service can be taken care of on third floor of the Administration-Clinics building, or in the proposed out-patient clinics building recommended below.

3. An "Out-patient Clinics" building of reinforced concrete, in harmony with design of present hospital structures, on the site of the Catholic chapel, is recommended for the purpose of housing the medi-

cal, surgical, and genito-urinary out-clinics, and pharmacy. The present location of these clinics in the Administration-Clinics building renders them very inconvenient of access to out-patients visiting them.

4. With completion of permanent hospital buildings, steps should be taken to provide permanent quarters for hospital staff and gold employees in accordance with proposed plans. At least two of these quarters buildings should be constructed each year until completion of proposed layout. It is a waste of time and money to repair present old quarters used by gold employees.

5. A recreation hall, consisting of two large open pavilions of reinforced concrete in keeping with design of other hospital buildings, located on the hillside, is desirable for the use of convalescent patients. Such a building should be provided with covered passageways leading to same from the other sections of the hospital. The hillside, also, should be terraced and set out in tropical plants and trees (mostly fruit trees), and improved by walks, etc., to provide a suitable place for exercise of convalescent patients, especially those having tuberculosis for whom no provision of means of out-of-door exercise has been made.

6. Some provision should be made for locating at some suitable place within the Canal Zone a sanitorium for the purpose of treatment of tuberculosis, with view to segregating this class of patients in the Canal Zone. Under present conditions, these cases are sent into Ancon Hospital, for segregation in the isolation section, which is not well adapted nor of sufficient size for their accommodation.

7. Two large tennis courts and a swimming pool should be constructed for use of gold personnel in close proximity to the nurses' quarters. Some form of exercise is absolutely necessary in this climate to maintain hospital employees in the state of physical fitness demanded by their duties. To encourage them to take this needed exercise, the means therefor must be in close proximity to the location of their quarters.

8. Nurses' quarters has but 72 single rooms, while the force authorized is 78 nurses, stewardess, and dietist, making it necessary that rooms be not held for those on vacation and to resort to two in a room occasionally. Should the daily average of the hospital exceed 500, additional nurses would be required. It is recommended that the present nurses' home be extended to add 16 rooms, making a total of 86 rooms available.

COROZAL HOSPITAL.

BUILDINGS.

The new hospital ward, which will accommodate about 80 patients, has been erected and will be ready for use in a few days. This will reduce our congestion on the male wards only to a certain extent, as one of the old buildings is to be turned over to the chronics of Ancon Hospital. The ward which was previously occupied by the working patients will be placed at the disposal of tubercular patients as an isolation ward. *(Plate 17.)*

A road from the dairy to the new feeding platform was built by our own employees and a feed room is at present being constructed at the end of the platform, where the feed for the pigs will be kept. The chicken house was demolished and the old lumber is being utilized for the construction of the feed room.

A fence has been placed around the feeding platform and we will keep all our pigs in this new pen when the new feed room is finished.

The roofs of all hospital buildings have been painted during the last year by the Building Division, while the outside was painted by our own help, mostly by patients.

HOSPITAL DEPARTMENT.

The completion of the new ward will facilitate the treating of our patients in a more scientific and modern manner. This building has four wards and a hydrotheraupeutic room as well as a day room, a few strong rooms and private rooms. It is constructed on a modern plan; the wards are open so that the patients may be observed more carefully; only those of a violent nature will be secluded.

There were 151 admissions during the year. With the regular sailings of the boats to the West Indies we have been able to deport many patients during the last few months, and as a result the population on December 31, 1919, consisted of 215 males and 169 females.

Various forms of amusements as in previous years have been continued. Our occupational department where we have been making rugs, hats, and other small items received a new impetus during the latter part of the year. Upon our request the Mental Hygiene Society, sent down (without charge), an industrial instructor with $200 worth of material, who remained here 3 months; she established a workroom and instructed the chief nurse in the essentials of an industrial department. We have succeeded in establishing an occupational department of a high standing, comparable to the best hospitals in the States. Our patients, although of a lower strata, have taken up this work very enthusiastically and are making rugs, toys, children's furniture, weaving bags, block printing, wood carving, etc. This work is very beneficial to this kind of patients, for it not only removes them temporarily from their world of fantasy, but also re-educates them and stops their mental deterioration. We have succeeded in selling most of the articles made and it is hoped that in the future this department will more than pay for itself. Nor has this new undertaking curtailed any of the previous work, such as farming, laundry work, or work in the sewing room and most of the male patients are still cultivating the land. During the month of November the produce from the patients' garden amounted to $596.28, and for December, $602.71, as compared with $347.77 in November, 1918, and $294.42 in December, 1918. (Plates 18 and 19.)

The plan whereby the patients receive payment for their work has been successful to the extent that many of the patients who had no initiative or desire to get about are influenced by the idea of obtaining *some* money in this way, with which they are able to buy their little luxuries, such as tobacco, candies, etc. (Plate 20.)

With the present staff we are able to keep up our records to date. Each patient admitted in brought before conference for examination and outline of treatment and also before his discharge from the hospital.

HOSPITAL GROUNDS.

The grounds in the enclosure have been kept in order by the patients' help. One thousand feet of drain has been laid in the hospital grounds by them, improving appearances as well as sanitation. All the walks in the enclosure have been repaved by the same means.

FARM DEPARTMENT.

Dairy.—On December 9, 1919, 25 grade Holstein bred heifers arrived from the States. These came from the noninfected tick area and steps have been taken to immunize them from the tick fever. These cows have been innoculated with blood containing *Piroplasmis bigeminis*, by the staff of the Board of Health Laboratory, and so far have reacted favorably. A special report will be made when the immunization is completed. One registered Holstein bull calf was purchased from the cattle industry as sire for this herd. The other cows are being sired by a registered Jersey bull. A tuberculin test of all cows was made in November. The dairy herd consists of 61 grade cows, besides the Holsteins previously mentioned, one registered Jersey bull, one grade Jersey bull, and 34 calves.

Our milk has continued to be of a high standard, being pasteurized after each milking, and showing a low bacterial count. It has a fat percentage of 4 to 5.

A request has been placed on the Building Division for the installation of refrigerating apparatus for the milk room, so that the cooling of the milk may be done by refrigeration, reducing the cost and also lessening the amount of handling. It is believed we can produce a certified milk with low bacterial count when the refrigerating apparatus is installed.

Piggery.—Most of our pigs, after being fattened, were sold to the Supply Department, leaving us only 48 for some time; in the latter part of the year however we purchased 100 barrows and 12 sows. For the past 2 months a pig has been slaughtered each week for the use of Ancon Hospital. The number of pigs on hand December 31, 1919, was 174.

Garden labor consists mostly of crippled employees who received their injuries in the service of the Canal. With the high cost of this class of labor, the garden has shown a loss; the attention of the Governor was called to this, with recommendation that a committee be appointed for drawing up plans to place the farm on a more efficient basis by allowing such crippled employees as desire, to work a certain part of the garden, the hospital to market their products for them.

We have had no success in raising rabbits for the Board of Health Laboratory, as most of them die of coccydiosis. Guinea pigs, however, do well, and up to about 5 months ago the laboratory was supplied regularly with them. This was stopped in order to increase the stock.

General.—With the new plan to reorganize the farm, some of the cripples will be taught some kind of work or industry whereby they will become more nearly self-supporting. This will necessitate a building, and the installing of light machinery. In this building we would be able to train some of our patients along with the cripples, in various kinds of industries.

The general health of the cripples remains good, the number remaining at the hospital at the end of the year being 9 white and 42 black—a reduction of two during the year, one having died of cancer of the esophagus, and one accepted settlement of his claim and was sent to his native country.

COLON HOSPITAL.

The present personnel of the hospital including Colon dispensary which is located within the hospital and is under the direction of the hospital superintendent, is as follows:

1 superintendent.
4 physicians.
2 internes.
10 nurses.
1 pharmacist.
2 clerks.
1 storekeeper.
34 silver employees.

The present arrangement makes it necessary to correlate and harmonize the work of the dispensary with that of the hospital and consequently it is necessary to use hospital personnel for dispensary work and *vice versa*. The Colon district physician has charge of the medical cases in hospital, an arrangement which is very satisfactory. One of the physicians and the medical interne assist the district physician in this work. The Superintendent has charge of surgical cases and supervises all work of the hospital and dispensary.

Emergency cases from the dispensary are admitted to Colon Hospital, and others, both medical and surgical, are transferred to Ancon and Santo Tomas hospitals. Efforts are made to keep the number of patients under treatment at Colon Hospital to 50 or below.

During the past year much work and effort has been expended towards beautifying the hospital grounds. Considerable dirt fill will be necessary in the near future in front of the hospital if appearances are kept up to what they should be. At present grass can not be grown over the area nearest the bay on account of lack of sufficient earth, the coral formation supporting very little vegetable growth.

The buildings consist of the following:

Hospital and dispensary.
Nurses' quarters.
Quarters for the staff (a 4-family apartment).
Quarters for silver employees, three buildings.
Garage.
Storehouse.
Morgue.

The institution is located in an almost ideal place for a tropical hospital. The surrounding grounds are ample for a much larger institution. It is believed that with the growth of Cristobal, Colon, various Army and Navy posts and stations, the increased amount of shipping and business on this side of the Isthmus, the demand will be urgent for new construction in order that infectious diseases originating on this side of the Isthmus and those brought in by ships may be treated here. A ward for the care of a larger number of obstetrical cases will soon be a necessity.

As the Republic of Panama does not maintain a hospital on this side of the Isthmus for the care of its indigents, it is believed that the installation of a charity ward attached to this hospital and supported by the Republic of Panama should receive serious consideration.

Board of Health Laboratory.

(Operated in connection with Ancon Hospital—Plate 16.)

The past year has been one of readjustment in the laboratory, as in the other divisions of the department. Members of the war-time staff have left and, with but one exception, those of the permanent staff have returned.

There have been no epidemics during the year, to be followed by the large amount of laboratory work which they usually entail. There was a sudden and temporary increase in the malaria rate during June and July. An effort was made to ascertain the malaria index of Camp Bierd, a laboring camp from which many cases were coming. Blood films and spleen examinations were made on 514 individuals. The splenic index was 13 per cent, the parasite index 0.4 per cent. The enlarged spleens were mostly found in natives from the interior who had been recently employed. In the group examined were 47 children between 2 and 10 years of age. None of these had splenic enlargement and but one exhibited parasites. As a result of intensive sanitation and the employment of additional mosquito catchers, the rate quickly dropped and no more work was done along this line. (*See* under General Remarks.)

A determined effort is being made by the health officer of Panama to give the city of Panama as pure a milk supply as that enjoyed in the Canal Zone and the best regulated communities in the United States. This has necessitated the bacteriological and chemical examination of a large number of milk specimens, which will become a part of the permanent routine of the laboratory.

There has always been a demand for the laboratory to do a larger number of the simpler examinations formerly done in the wards by the attending physician, such as the examination of blood films for malaria parasites, eye smears for the gonococcus, urines for albumin. For several reasons it has been found advisable for the laboratory to meet this demand and an increasing amount of this work is being done.

In addition to the autopsies on wild and domestic animals, given on page 55, a herd of 25 Holstein cattle at the Corozal dairy has

been given a primary injection of defibrinated blood from an animal infected with piroplasma. These cattle are from 2 to 4 years of age and have just arrived from a section of the United States which is free from piroplasmosis. They are being held in a screened stable until immunity is established. In the meantime a study of the disease induced in them is being made.

During the year 5,475 rats and 11,426 mice were autopsied. These rats were received from the piers of the terminal ports, from ships which were fumigated, from the cities of Colon and Panama and from the Canal Zone sanitary inspectors. None of the autopsy findings were suspicious of plague. Cultures were made and animal inoculations performed in every instance where there was evidence of an infectious process. The possibility of animal plague was also borne in mind during all autopsies on the wild and domestic animals.

PATHOLOGICAL REPORT.

During the year 324 autopsies were performed at the Board of Health Laboratory. The causes of death were recorded as follows:

General diseases.

Typhoid fever	3
Malaria fever, estivo-autumnal	1
Malaria fever, mixed	1
Whooping cough	2
Diphtheria	1
Dysentery, bacillary	2
Dysentery, unclassified	1
Yellow fever	2
Erysipelas	1
Purulent infection and septicemia	1
Pyemia	1
Septicemia	1
Pellagra	5
Tuberculosis of the lungs	33
Acute miliary tuberculosis	2
Tuberculous meningitis	5
Pott's disease	2
Tuberculosis of other organs	1
Disseminated tuberculosis	12
Syphilis, tertiary	3
Syphilis, hereditary	1
Cancer of the stomach and liver	3
Cancer of the uterus	5
Cancer of other organs	3
Diabetes	1
Leukemia, lymphatic	1
Anemia, chlorosis	1
Anemia, secondary, cause not determined	1
Purpura hemorrhagica	1
Total	97

Diseases of the nervous system and of the organs of special sense.

Encephalitis	1
Simple meningitis	6
Cerebro-spinal fever, meningicoccic	1
Pneumococcus meningitis	2

Diseases of the nervous system and of the organs of special sense.—Contd.

Other diseases of the spinal cord	2
Cerebral hemorrhage, apoplexy	7
Softening of the brain	5
Paralysis without specified cause	1
General paralysis of the insane	4
Other forms of mental alienation	2
Epilepsy	1
Convulsions of infants (under 5 years of age)	1
Other diseases of the nervous system	1
Tumor of the brain	1
Total	35

Diseases of the circulatory system.

Malignant endocarditis	3
Organic disease of the heart	17
Rupture of the aorta (aortitis)	1
Aneurysm	4
Status lymphaticus	1
Total	26

Diseases of the respiratory system.

Broncho-pneumonia	9
Pneumonia, unqualified	1
Lobar pneumonia	12
Gangrene of the lungs	2
Total	24

Diseases of the digestive system.

Obstruction of stomach and duodenum by adhesions	1
Diarrhea and enteritis (under 2 years)	6
Colitis (under 2 years)	3
Diarrhea and enteritis (over 2 years)	1
Hernia, intestinal obstruction	2
Duodenal ulcer	2
Cirrhosis of the liver	2
Abscess of the liver, entamebic	4
Simple peritonitis (nonpuerperal)	1
Total	22

Nonvenereal diseases of the genitourinary system and adnexa.

Acute nephritis	7
Bright's disease (chronic nephritis)	14
Pyo-nephritis, acute	2
Pyelo-nephrosis	5
Gangrenous cystitis	1
Salpingitis, acute	1
Total	30

The puerperal state.

Eclampsia	1

Diseases of the skin and of the cellular tissue.

Phlegmon and cellulitis	1

Diseases of the bones and of the organs of locomotion.

Arthritis	1

Malformations.

Congenital malformations (stillbirth excluded)	10

Diseases of early infancy.

Premature birth	4
Atrophy of infants	1
Malnutrition	46
Traumatism as a result of difficult labor	2
Total	53

Affections produced by external causes.

Cocaine poisoning	1
Burns (conflagration excepted)	2
Accidental drowning	1
Traumatism by firearms	2
Traumatism by fall	4
Traumatism by crushing	4
Starvation (Bulbar paralysis)	1
Total	15

Ill-defined diseases.

Ill-defined cause of death	2
Infection of undetermined origin	1
Total	3
Stillbirths	6
Grand total	324

The most frequent causes of death recorded in the above autopsies were as follows:

	Cases.	Per cent.
Tuberculosis	55	16.9
Malnutrition	46	14.1
Pneumonia	22	6.7
Organic heart disease	20	6.1
External causes	15	4.6
Chronic nephritis	14	4.3

Table showing the more common causes of death at autopsy in the Board of Health Laboratory.

Date.	Number of autopsies per year.	Pneumonia.	Tuberculosis.	Haemoglobinuric fever, malaria.	Affections produced by external causes.	Chronic nephritis.	Combined types of dysentery.	Organic heart disease.	Typhoid.	Diarrhea and enteritis (children).	Cancer.
1904	6	1	1	...	...	...	...	...	...	...	...
1905	260	60	9	27	3	8	5	3	9	...	...
1906	509	191	22	50	24	23	39	15	33	...	...
1907	496	156	35	27	40	27	36	12	58	4	4
1908	361	59	63	46	26	25	23	11	14	...	...
1909	295	55	37	26	32	31	11	17	11	1	5
1910	451	50	91	52	30	37	36	16	10	6	4
1911	508	83	102	41	38	36	19	20	9	11	11
1912	425	53	79	23	37	27	15	22	6	7	11
1913	460	47	89	21	34	26	8	26	5	23	12
1914	375	36	78	6	38	12	6	27	5	14	3
1915	328	28	56	14	20	12	5	14	2	15	10
1916	323	25	81	8	17	20	7	10	6	9	7
1917	330	24	51	5	21	23	3	18	1	3	5
1918	253	38	68	6	6	12	...	8	...	1	5
1919	324	22	55	3	15	14	3	20	3	10	11
Total	5,713	928	917	355	381	333	216	239	172	104	199

Table showing number of autopsies performed revealing the following diseases per year.

Date.	Autopsies performed per year.	Yellow fever.	Beriberi.	Ankylostomiasis.	Tetanus.	Infectious diseases of children.	Plague.	Smallpox.
1904	6	...	...	...	...	...	...	...
1905	269	12	7	7	2	...	1	...
1906	509	1	5	4	...	...	...	...
1907	496	...	1	12	1	...	...	...
1908	361	...	1	12	3	...	...	...
1909	295	2	...	...	...	...	1	...
1910	451	2	...	...	...	...	...	...
1911	508	...	1	1	1	...	1	...
1912	425	1	...	...	1	4	...	...
1913	460	...	...	2	3	1	...	...
1914	375	...	1	...	4	2	...	...
1915	328	3	1	...	2	1	...	...
1916	323	...	2	...	...	3	...	1
1917	330	...	7	...	1	2	...	...
1918	253	...	...	2	...	3	...	...
1919	324	2	...	...	...	3	...	...
Total	5,713	23	26	20	18	19	3	1

Five hundred and twenty-one bodies passed through the laboratory during the year, of which 324, or 62.1 per cent, were autopsied. During the year 431 surgical specimens were received and reported. Cancer was found in these tissues and among the autopsies as follows:

Race.	Sex.	Age.	Location.
Black	Female	46	Cervix.
Black	Female	50	Uterus and cervix.
Black	Female	34	Cervix.
Black	Female	32	Uterus and cervix.
Black	Female	29	Cervix.
Black	Female	36	Cervix.
White	Female	51	Stomach and colon.
Black	Female	38	Liver and omentum.
Black	Female	30	Liver.
Mestiso	Female	(?)	Liver.
White	Female	49	Abdominal organs.
Black	Female	36	Pleura and lung.
Black	Female	33	Lungs and pleura.
Black	Male	67	Lungs and pleura.
White	Female	66	Right breast.
(?)	Female	55	Left breast.
Black	Female	36	Left breast.
Black	Female	(?)	Right breast.
Black	Male	33	Buttock to lungs and pleura.
Black	Male	63	Oesophagus.
Black	Female	43	Uterus and myomata (transition).
Black	Female	46	Uterus.
Black	Female	45	Cervix and vagina.
White	Male	(?)	Bladder.
Black	Female	28	Vulva.
Black	Female	50	Vagina.
White	Male	24	Anus.
Black	Male	25	Gum.
Black	Male	28	Jaw.
White	Male	(?)	Jaw.
Black	Male	48	Tongue.
White	Male	(?)	Neck.
(?)	Male	42	Neck.
(?)	Male	(?)	Eyelid.
White	Female	30	Eyelid.
White	Female	49	Eyelid.
White	Male	56	Cheek, right.
White	Male	50	Forehead.
(?)	Female	48	Face.
White	Male	(?)	Lip, lower.
Black	Male	44	Nose.
Black	Male	39	Nose.
White	Male	34	Antrum, left.
White	Male	36	Nose.
White	Male	54	Lip, lower.
White	Male	48	Face.
White	Male	(?)	Face.
White	Male	57	Back.
White	Male	31	Supra-clavicular gland.
Black	Male	34	Left arm.
White	Male	(?)	Hand.
White	Male	21	Knee, left.
White	Male	30	Epididymus.

These cases represent either ædenocarcinoma, epithelioma, o sarcoma.

PATHOLOGY OF DOMESTIC AND WILD ANIMALS.

In addition to the routine work autopsies have been done on the following animals and fowls:

Goats	2
Cows	2
Dogs	5
Horse	1
Cat	1
Chickens	8
Deer	4
Cordice (*Tinamon castaneiceps*)	2
Turkey, wild (*Penelope cristata*)	2
Snake	1
Fish	1

Miscellaneous examinations have been conducted on the blood films of various animals and fowls as well as some examinations of ectoparasites and parasites of the muscular system.

During the year 11,413 Wasserman tests were performed on 9,260 persons. The results of these tests are summarized in the following tables:

WASSERMANN REACTIONS DURING THE YEAR 1919.

Based on the number of individuals examined and not on the number of tests made.)

	Positive.	Negative.	Total.	Per cent positive.
White, civil:				
Males	205	1,371	1,576	13.0
Females	22	251	273	8.0
Children		3	3	
White, soldiers, male	198	1,392	1,590	12.45
Total	425	3,017	3,442	12.34
Spanish and white natives:				
Males	111	499	610	18.19
Females	18	86	104	17.3
Total	129	585	714	18.0
Blacks and mulattos:				
Males	1,194	2,606	3,800	31.42
Females	366	888	1,254	29.18
Children	5	20	25	20.00
Total	1,565	3,514	5,079	28.84
Chinese, males	5	20	25	20.00
Grand total	2,124	7,136	9,260	23.93

In addition, Wasserman tests were made on 366 spinal fluids from as many individuals, and of these, 106, or 28.96 per cent, were positive.

During the year 1,353 throat cultures were examined for diphtheria; 148 of these, from 64 individuals, were positive.

B. typhosus was recovered in blood culture from 24 individuals; 8 of these cases were from shipboard and 1 was contracted in the United States. Three *B. typhosus* carriers were detected. One left the country, the other two were paroled under sanitary surveillance.

The following organisms were also recovered in blood cultures:

B. coli group	3
B. proteus group	1
Streptococcus	2
Staphylococcus	1
Pneumococcus	12
Type I	2
Type II	1
Type II atypical	3
Type III	2
Type IV	4

CHEMICAL DEPARTMENT.

The work in the chemical laboratory has been of the usual general character. It has included the examination of milks, beverages, drugs, canned foods, miscellaneous supplies, as well as clinical examinations requiring quantitative determinations. As a routine measure, toxicological examinations have been made in every instance of death from unknown causes. Lange's colloidal gold test, as well as the usual tests for increased globulin content, have been made on spinal fluids submitted to the laboratory. The total number of miscellaneous examinations made during the year has been 981; the number of spinal fluids tested, 434.

In addition to the work done, preparations have been made to extend the scope of the work in blood chemistry so that all quantitative determinations for diagnostic purposes may be made rapidly and in as large numbers as desired.

A considerable amount of work has been done upon canned salmon in the chemical department and summary of the results obtained is given. An effort was made to determine to what extent a chemical examination would indicate the presence of bacteria, or the extent of bacterial growth. To this end canned salmon, the very best grade obtainable, was ground, made up into suspensions, sterilized, and then inoculated with different organisms. Determinations were made of acidity, amino acid nitrogen and ammonia, as the growth of bacteria in meat and meat products is generally considered to affect these factors. It was found, in the case of putrefactive organisms, that the changes that took place were too slight to be detected up to the point where the putrefactive changes could be recognized by smell. From that point the chemical results were quite in accordance with the generally held ideas on the subject. In the case of nonputrefactive organisms, examined where there was a considerable growth and multiplication of the organisms, there was no change in the above-named factors that could be used as a positive indication that the bacteria were, or had been, present. This was particularly true in the tests made with *B. paratyphosus*, *B.* The results so far

secured indicate that the chemical methods used to study the progress of protein cleavage can not be relied upon to detect bacterial contamination of canned flesh foods.

ENTOMOLOGICAL DEPARTMENT.

This department covered the field of medical, sanitary, and economic entomology, with special reference to the identification of mosquitoes, of arthropods affecting the health of man and animals, inspections of mosquito-breeding areas, the study of insects infesting food and stored products, household insects, forage crop insects, vegetable and truck crop insects, and the study of the more important pests of tropical fruit trees. The work in economic entomology was of a cooperative nature with the Bureau of Entomology, U. S. Department of Agriculture, which bureau established a temporary field station at this laboratory, and detailed Mr. Harry F. Dietz, an entomological inspector of the Federal Horticultural Board in charge of the station, with Mr. Ignacio Molino as entomological laboratory assistant. Upon Mr. Dietz's departure in August, the project was placed temporarily in charge of the Board of Health entomologist as collaborator of the bureau.

The main object of the temporary field station is to learn what dangerous pests occur on the Canal Zone, and whether the concentration of traffic and commerce from all parts of the world is not adding new and serious pests to our territory. Such dangerous immigrants, together with the endemic pests, would be potential menaces to continental United States. The surveys and inspections made thus far, covering almost a period of 2 years, have yielded a large amount of valuable information regarding pests already established, and that our piers, especially those at Cristobal, are splendid mediums for the introduction into the Canal Zone of new and serious enemies. Such insects are also a danger to other cargo on the piers awaiting transshipment because it is very easy for eggs or other stages of these insects to reach such cargo and thus arrive at other ports. These facts indicate the necessity for a port inspection and plant quarantine service, with adequate facilities for vacuum fumigations at both terminals, as the only means which will protect against such dangerous insects.

The more important investigative work in economic entomology has been on the spiny citrus white-fly or mosca prieta (*Aleurocanthus woglumi*), the avocado weevil (*Heilipus* sp.), termites and fruit-flies. Papers on the first three are in the press.

Medical entomology.—The following table includes only such mosquitoes as have been sent to the laboratory for identification; it does not include the total mosquito catch at all our stations and camps. *Anopheles malefactor*, Dyar and Knab, 1907, has been shown by Dr. Harr. G. Dyar to be identical with the unique *A. punctimacula* described by Dyar and Knab in 1906; hence adhering strictly to the rule of priority, the name *punctimacula* is used instead of the better known *malefactor*.

	Number of adults.	Lots of larvæ.
Culicini—		
Anopheles albimanus	10,158	30
Anopheles tarsimaculata	6,442	6
Anopheles argyritarsis	5	4
Anopheles pseudopunctipennis	971	7
Anopheles punctimacula	126	3
Anopheles apicimacula	180	.....
Total anopheles	17,881	40
Aedes calopus	840	142
Aedes tæniorhynchus	3,574	4
Aedes spp.	.....	12
Hæmagogus (3 species)	25	6
Culex quinquefasciatus	6,796	17
Culex spp.	4,213	68
Lutzia allostigma	.....	1
Deinocerites melanophyllum and pseudes	79	5
Mansonia titillans	2,934	.....
Mansonia nigricans	141	.....
Mansonia fasciolatus	42	.....
Aedeomyia squamipennis	8	.....
Orthopodomyia fascipes	.....	1
Psorophora posticata	51	.....
Uranotænia geometrica	.....	6
Uranotænia lowi	1	.....
Uranotænia typhlosomata	.....	1
Total culicini minus anopheles	18,704	263
Sabethini—		
Wyeomyia, Limatus, Sabethinus, etc.	279	4
Grand total	36,864	307

The drop in the numbers of *Mansonia titillans* is due to the gradual abandonment of the stations on the west side of the Canal. As very little sanitation was done in the territory from Bas Obispo to beyond Gorgona, water lettuce filled in the bayous and the *Mansonias* were breeding out in very large numbers; these breeding areas are close to the towns of Las Cascadas and Empire; former army camps, where our high *Mansonia* catch came during 1918. The above table may give a misleading idea regarding the *Aedes calopus* situation. The reason for the high number of lots of larvæ of this species is because an unusually vigorous survey of Colon and Panama cities was undertaken to learn how much of this sort of breeding actually occurs. The high adult catch is mostly from the native town of Taboga, on Taboga Island, 12 miles from Balboa; no sanitation is done here and *calopus* breeding is fairly prolific. The high catch of *Culex quinquefasciatus* is almost entirely from a small army detachment at David, Province of Chiriqui, Panama. Practically the entire catch from there was this species. The majority of adults given as *Culex* spp. are from that station, and undoubtedly are *quinquefasciatus*, but owing to the very poor condition of the specimens, a definite determination to species was not made.

Investigation of the so-called "floating islands" of Gatun Lake, Chagres River, and the Canal cut south of Gamboa, discloses extensive breeding of *Anopheles albimanus* and *tarsimaculata* that may yet

be a potential source of danger from malarial infection at present no such result appears to have occurred. These re composed largely of water lettuce, *Pistia stratiotes* L., ally some water hyacinth, *Eichornia crassipes* Solms, algæ is present. The *Anopheles* larvæ were found in great among the leaves of these plants, where they are protected e action and young fish. The Dredging Division is attempt- stroy this vegetation by means of an arsenical preparation y a power spray mounted on a barge; while fairly successful, expensive, but is justified as a necessary measure in keeping l free from these obstructions.

of *Anopheles argyritarsis* Desv. were found in tin cans at iguel and on the west side of the Canal, but these tins were ell concealed by vegetation.

isually heavy influx of *Aedes tæniorhynchus* appeared at the g of the wet season, and continued strong for about three It was especially heavy on the Atlantic side; at Fort , mules a mile away from the post were frequently covered ly with these mosquitoes. At about this same time sand me a great nuisance at Coco Solo Submarine Base and ield.

ive direct observations of mosquito flight were made at uring June. About ten observers were used at each time, evening flight was considered. These observations showed main heavy influex of *Anopheles* was from the hydraulic fill orthwest of Gatun, beyond the old French Canal—a n of our 1913 experience (see *Annals Ento. Soc. Am., VIII*, pp. . A smaller influx came from the Mindi swamps north of With the new army camp north of Gatun, this swamp will, obability, cause much trouble. An interesting discovery in n with these flight experiments was the use of a flashlight lens covered with thin tissue paper. By making inter- lashes at an angle of about 45°, and at right angles to the of flight, it was possible to discern the mosquitoes as they ward Gatun. The predominance of a single direction, and r hasty flight, were evidence enough that actual flight was ss. By noting the abundance of individuals involved, it ible to determine when the flight was at its maximum. s could be distinguished from *Culex* with no great trouble.

ichlorobenzene was found to be very effective in preventing ling of larvæ of the yellow-fever mosquito in ant-guards, ases and such containers, with camphor a close second. stances must be used in powdered form, and one application d to be effective for from 7 to 10 days. Two grams of the e were used for each container. Camphor would be pre- o doubt, for holy water urns. If two parts of camphor and ara-dichlorobenzene are heated together, they form a liquid mains a liquid at room temperature. This liquid is easier than the solids. The liquid settles to the bottom of the con- id after about 24 hours there, it begins to crystallize. One t with the liquid insecticide was found to retain its effective-

ness for from 10 to 15 days. The odor is not objectionable. A report of this is in press (*Journ. Economic Ento.*).

Larvæ of *Volucella obese* Fabr., a syrphus fly, were found in a bottle containing "nahche" fruit (*Byrsonima crassifolia* HBK), evidently scavengers. Both the fruit and water had a decided fermented appearance and odor, yet the larvæ were very active therein and completed their life cycle in due time.

Economic entomology.—Citrus: The spiny citrus white-fly or mosca prieta, *Aleurocanthus woglumi* Ashby, is by far the most important of the citrus pests, particularly so because it has not as yet gained entrance into the United States. This insect is spreading gradually into the surrounding country. In the Canal Zone we have it at Cristobal, Mount Hope, New Frijoles, Pedro Miguel, Miraflores, Corozal, Ancon, and Balboa. In the Republic of Panama it occurs at Colon, Panama City, Las Sabanas, and Taboga Island; recently we received heavily infested leaves from Pocri and Aguadulce, Province of Coclé. It was not found on any citrus trees on the west side of the Canal, and as there have been a number of large native villages on that side, abandoned since 1915, it would appear that the infestation on the Canal Zone is relatively recent. Special attention is now being given to the effect of the dry season on the various stages of the pest, and to methods of control. Thus far paraffin oil and fish-oil soap, linseed oil and fish-oil soap, Panama Canal larvacide (crude phenol and rosin soap,) and kerosene emulsion have given the best results. The first of these appears to be the best spray. Of the natural enemies, two species of ladybird beetles, *Pentilia castanea* Muls. and *Scymnus horni* Gorh., and an undetermined lacewing insect (*Chrysopa*) at times clean up fairly heavy infestations. Sooty mold often sets in, covering all the leaves. If sprayed with larvacide and then followed by a spray of clean water (under pressure) in a day or two, both the sooty mold and the white-flies slough off, leaving the tree quite clean. Larvacide has the big advantage that it needs only to be mixed with water in the right proportions—a 5 per cent solution was found to be ample. The rains, provided they do not come within one or two hours of the spraying, help the control in that they wash off the insects and some of the mold.

Coccus viridis Green (soft green scale), which is also a serious pest of coffee, was found very abundant on citrus at the Juan Mina plantation. It is bound to cause damage unless definite control measures are followed. The red-eyed grasshopper and the leaf-cutting bee, *Trigona ruficrus corvina*, cause much damage to foliage, but their control is relatively simple. The stinging ant, *Solenopsis geminata* Fabr., caused considerable damage. It builds its covered runways up the tree and from these works out in new growth, eating off the bark and thus girdling the trunk or branch, or it tunnels at the base of new stems and causes these to break off. These ants usually are the beginnings of that heterogeneous group of citrus ailments called "mal di goma." The purple or mussel scale, *Lepidosaphes beckii* Newm., is not as abundant in the Canal Zone as in the adjoining Republic. The West Indian red scale, *Selenaspidus articulatus*, is by far the commonest of all our scales, and the most destructive; it attacks a great variety of plants, and often is very heavy on citrus.

w scale, *Chionaspis citri* Comst., was quite abundant at farm. The red-spotted scale, *Chrysomphalus aonidum* L., ıently found on citrus, but usually the infestation was very e scale is most destructive to roses.

ruit insects.—*Mango.*—No mango weevils were found this t Taboga Island, *Philaphedra broadwayi* (=*theobromæ*) was mango; this is also a serious scale pest of cacao. *Vinsonia Coccus mangiferæ* and the mosca prieta are the commoner l white flies on mangoes. Much fruit was seen showing s made by fruit flies. *Avocado.*—The avocado weevil, *Heilipus* the most serious insect pest so far at the Frijoles grove. wing scale insects were taken from avocadoes at this place; *is longirostris, Pulvianria pyriformis, Targionia biformis, hemisphærica* and *Ceroplastes sp.* From the appearance of : infestation, which is on the increase, a few years hence considerable damage due to them—unless control measures . *Papaya.*—The papaya fruit fly, *Toxotrypana curvicauda* the most serious papaya pest, with *Diaspis pentagoni* econd, although this scale is much easier to control. *Ba-'etamasius sericeus*, the West Indian sugar cane borer, was breed freely in banana stumps. Larvæ of the coconut , *Brassolis isthmia* Bates, were found to attack and eat banana plants. (*See* Jour. Economic Ento. XII, No. 6.)

t palms.—The coconut butterfly, rhinocerus beetle, palm nd bud rot are all present and destructive. The following ere found: *Pinnaspis buxi, Aspidiotus palmæ, Diaspis ii, Inglisia vitræ, Chrysomphalus dictiospermi* and *aonidum, stellifera* and *Ischnaspis longirostris.*

'orage, vegetable, and *truck crops.*—The fall army worm (*La-'rugiperda* S. & M.) is so far the most destructive pest of Several other cut-worms and the common chinch bug *leucopterus*) were also abundant at the Mindi pastures. pecies of flea beetles cause much damage to vegetable and ps. Termites are also serious pests of the vegetable garden. :, *Targionia hartii* Ckll., was found abundant on yams in markets.

ental plants.—Roses, cannas, crotons, lilies, hibiscus, and inds of vines are the principal ornamental plants in use. wing scale insects commonly attack them: *Hemichion-ıor* (very bad), *Chrysomphalus aonidum* (especially bad on *lenaspidus articulatus, Saissetia nigra, S. hemisphærica, S. vardia biclavis,* and *Orthezia prælonga.* The *Orthezia* often the leaves. *Icerya montserratensis* R. & H. frequently be-ite serious. The leaf-cutting ant, *Atta sexdens* L., is a very ıd destructive pest of ornamental shrubs and trees, but its nay be greatly ameliorated if concerted efforts are made to ıe colonies in their nests. A noctuid larva, *Xanthopastis* rma *molinoi* Dyar, was very destructive to lilies. The ny, *Plumeria alba*, often used as an ornamental tree, lo-wn as "caracucha," is usually well infested with scales, s, mealy bugs, and lepidopterous larvæ.

Household insects.—Roaches, ants, and termites are the most troublesome and destructive household insects, the ants and termites often causing great losses to property. *Nasutotermes corniger*: Hagen caused much damage to the woodwork of Hotel Tivoli. Termites are among the most destructive of all tropical insects. The tiny black house ant, *Monomorium pharaonis* L. is a serious nuisance especially to provisions. A single nest, usually concealed in the woodwork, may contain millions of individuals.

Stored food products.—Due to inadequate storage facilities and no means for satisfactory heat fumigation, this class of products becomes very often badly infested. Yet, stored products for human consumption were less infested this year than last, due to a large measure to the betterment of shipping conditions. The most serious cases of infestations were in feed for animals. At Balboa, 200 tons of oats were badly infested with *Tribolium ferrugineum*, *Tenebrio* sp., *Silvanus surinamensis*, silver fish (*Lepisma* sp.), an unrecognized Anobiid, *Calendra oryza* and the cadelle. At Corozal dairy, a six weeks' supply of "Larro" feed was badly infected with the same *Tribolium* and Anobiid. In both cases the loss caused was about 20 per cent.

Other stored products.—A ptinid, *Catorama herbarium* Gorh., caused considerable damage to a lot of corn brooms at the Balboa storehouse; about 75 per cent of the infested brooms were unserviceable.

Pier inspections.—Mention has already been made of the fact that ships bring to our piers many insects, some of which are new to our fauna and decidedly dangerous species, through the cargo they bring. Periodic inspections were made. Much of the cargo (mostly cacao, coffee, beans, etc.) is infested. Fruit-flies, moths, borers, and the usual series of stored food products insects, are the commonest insects intercepted. As soon as Panama's agriculture begins to spread out, and nursery stock, seeds, and bulbs are imported, we shall find a host of dangerous insects creeping in—unless there is established a port inspection and plant quarantine service, such as is in force in continental United States and in certain European countries.

Forest products.—Termites and borers cause a great amount of damage to timber, and as much of these woods are used for making crates for shipping goods to other countries, the opportunity presents itself to introduce some of these bad actors into other countries. One of the scolytids, *Xyleborus grenadensis* Hopkins, was found abundant in sawed Sandaty wood logs. The infestation appears to have taken place in the forest.

Plant diseases.—While no attempt has been made to make any kind of a thorough survey of plant diseases on the Canal Zone, we have come across a large number of serious ones. It should cause no surprise if there are as many, or more, bad plant diseases as there are bad insect pests. The need for a laboratory for plant pathology is evident.

Plate 2.—ANCON HOSPITAL. Entrance to grounds.

Plate 3.--ANCON HOSPITAL. Quarters of the Superintendent.

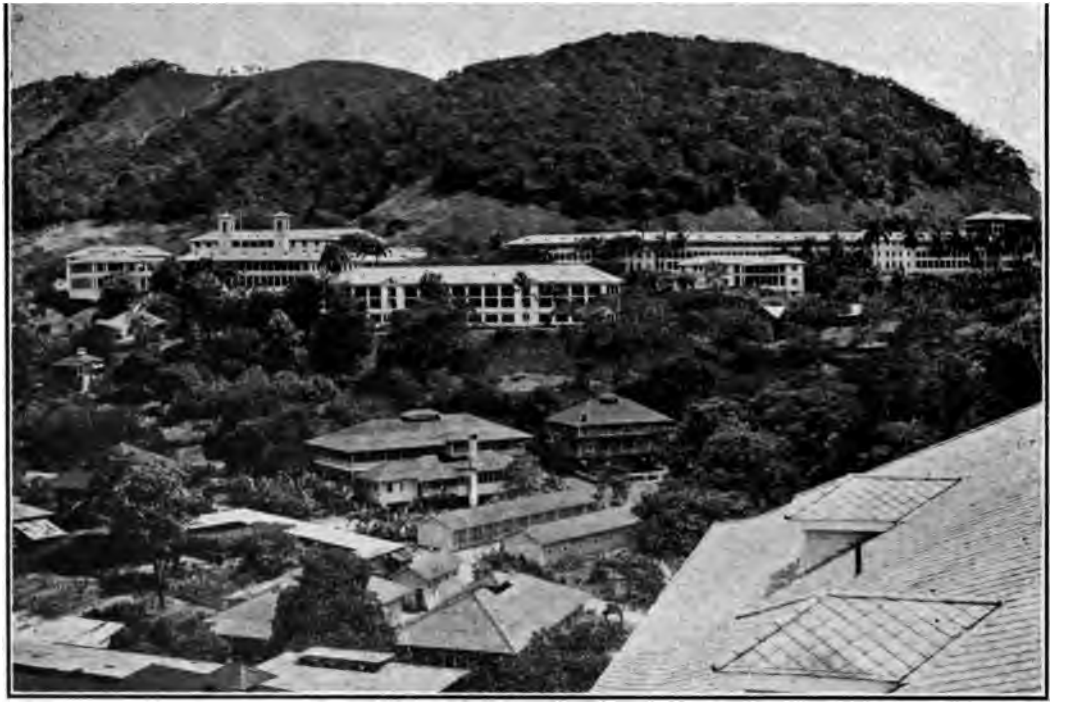
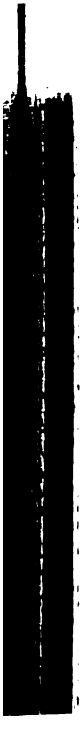


Plate 5.—ANCON HOSPITAL, with Ancon Hill in background, from roof of Tivoli Hotel.



PUBLIC LIBRARY

Plate 6.—Ancon Hospital. Grand staircase, main entrance.

Plate 7.—Ancon Hospital, Administration Building, with clinical and operating rooms.

LIBRARY

Plate 8.—Angoon Hospital. Portion of section "C." Three stories with basement in which are located workrooms and storerooms.

Plate 9.—ANCON HOSPITAL. Section "D."

Plate 10.—Ancon Hospital. Section "J." Isolation wards for contagious diseases.

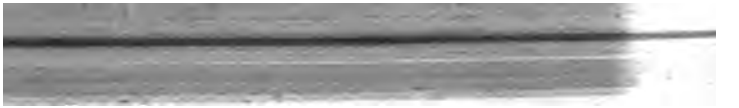


Plate 11.—ANCON HOSPITAL. Kitchen and dining rooms for employees and patients.

Plate 12.—Ancon Hospital. Nurses' quarters.

Plate 13.—Ancon Hospital. A medical ward.

Plate 14.—Ancon Hospital. A private room.

Plate 15.—Ancon Hospital. Part of X-ray laboratory and equipment.

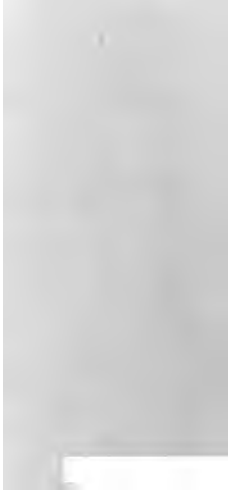
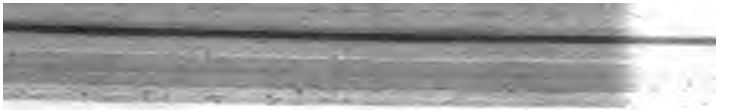


Plate 16.—Ancon Hospital. Board of Health Laboratory and (right) Crematory.

Plate 17.—Corozal Hospital. For insane patients and crippled employees of The Panama Canal. Two of the ward buildings.



18.—Cʼorozal Hospital. Insane patients working in the department of industrial hygiene.

NEW YO
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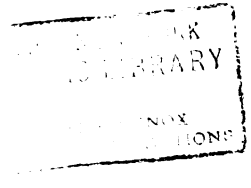
STOR LENO
ON FOUNDA

Plate 20.—Corozal Hospital. Part of gardens cultivated by the cripples. In addition to shelter, food, and clothing, they are paid an hourly wage, for all work done or are given a plot of ground to work on their own account.


RARY

ADMISSION RATE PER 1,000 EMPLOYEES.

Hospitals and Quarters.

ALL CAUSES.

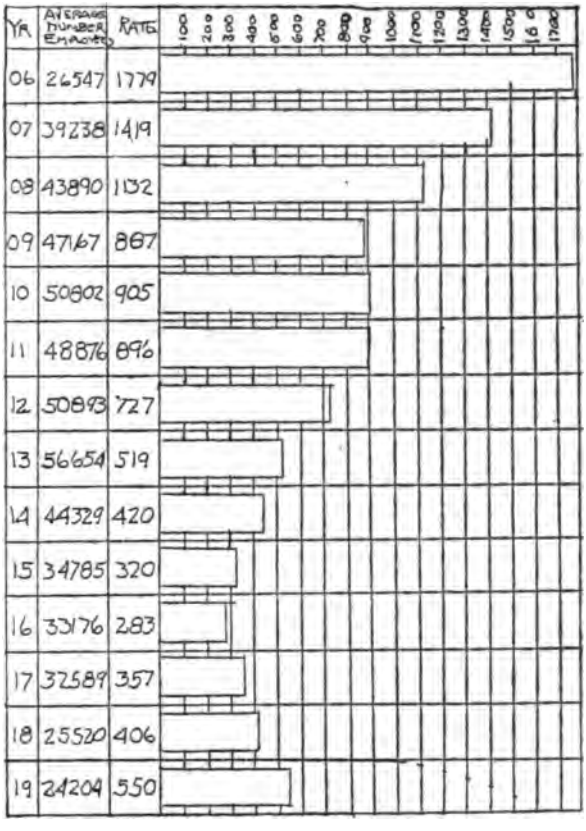


Chart No. 1.

DEATH RATE PER 1,000 EMPLOYEES.

ALL CAUSES.

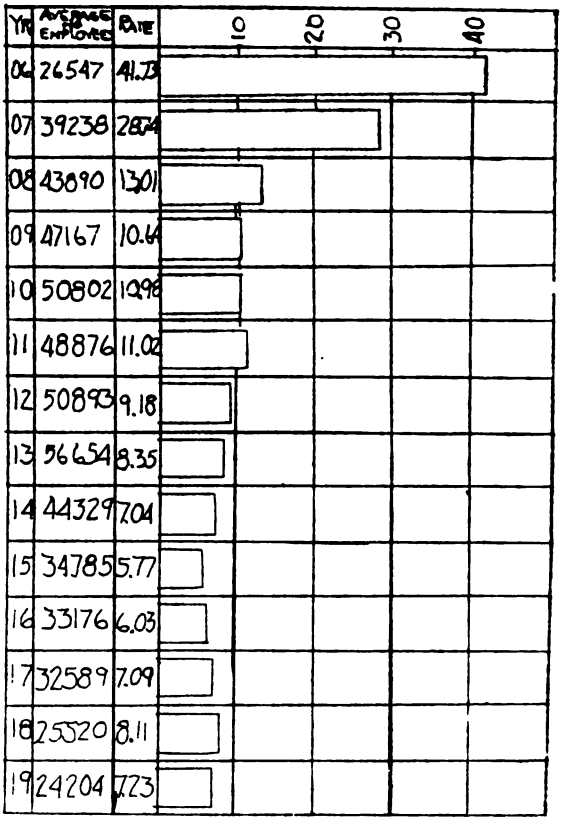


CHART NO. 2.

NONEFFECTIVE RATE PER 1,000 EMPLOYEES.

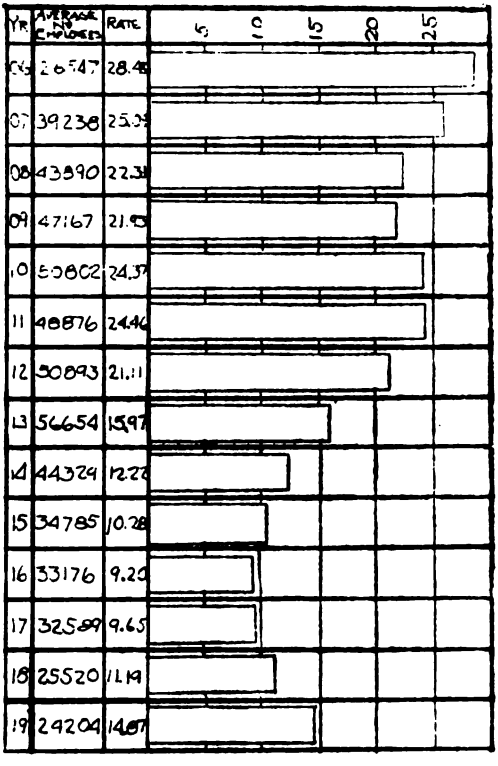


CHART NO. 3.

MALARIAL FEVER.

ADMISSION RATE PER 1,000 EMPLOYEES.

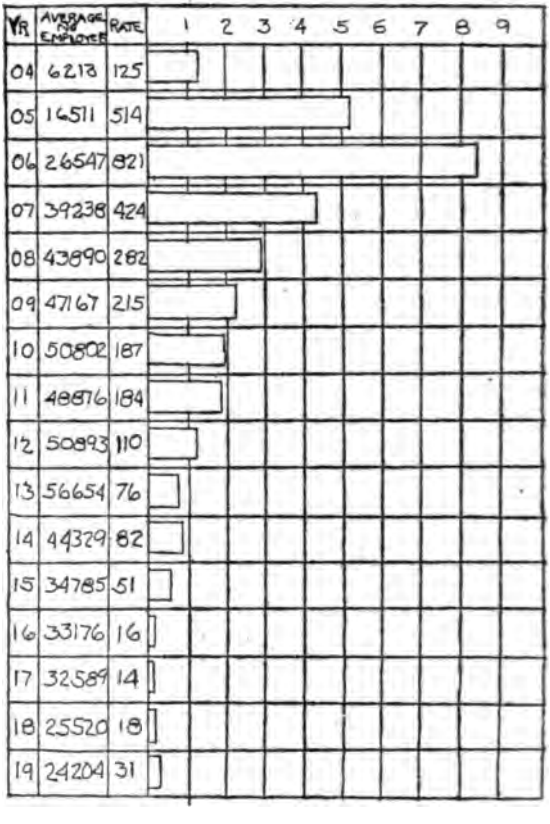


CHART No. 4.

MALARIAL FEVER.

DEATH RATE PER 1,000 EMPLOYEES.

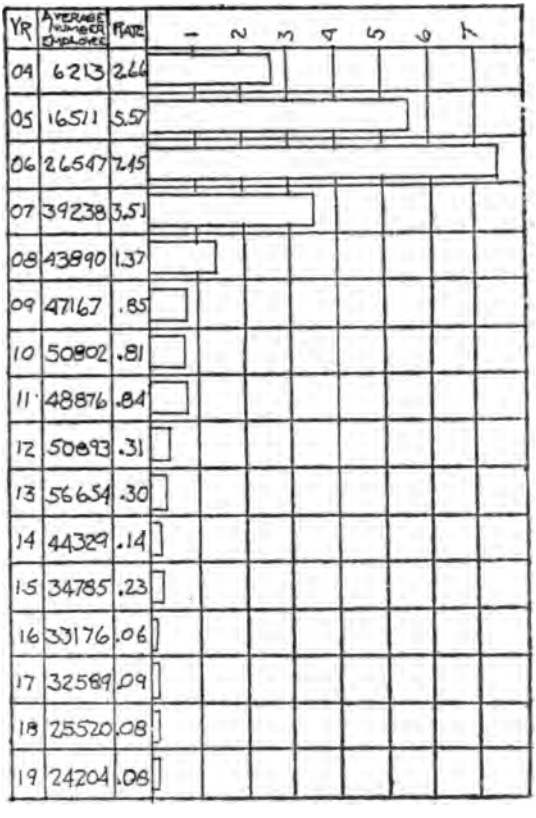


CHART NO. 5.

MALARIAL FEVER.

DEATH RATE PER 1,000 POPULATION IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

EMPLOYEES AND NONEMPLOYEES.

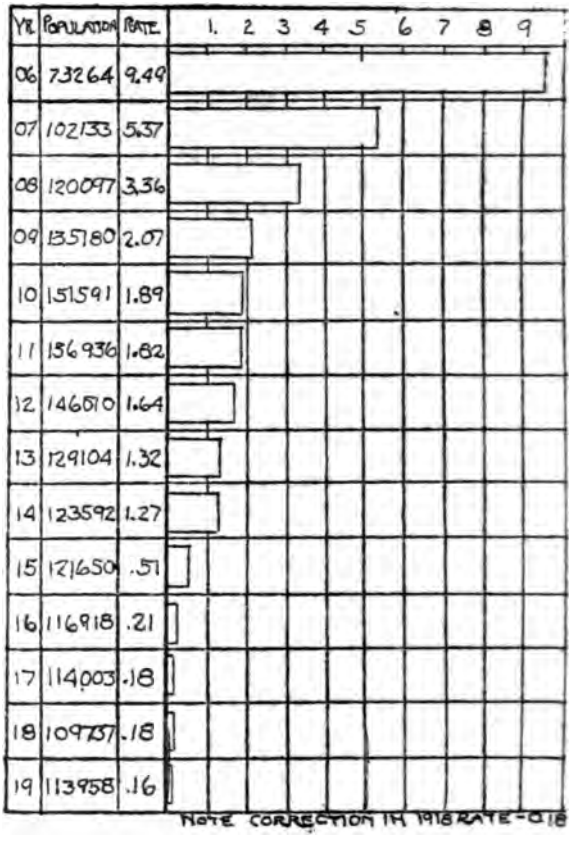


CHART NO. 6.

NUMBER OF CASES OF MALARIA REPORTED WEEKLY
FROM COLON AND CRISTOBAL.

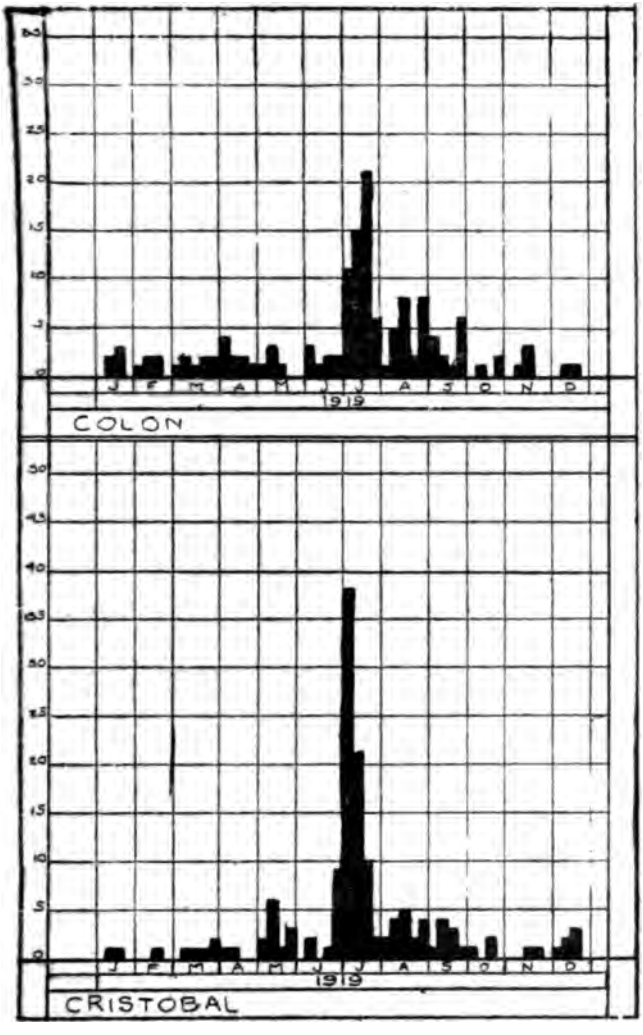


CHART NO. 7.

NUMBER OF *ANOPHELES* MOSQUITOES CAUGHT IN SCREENED QUARTERS OF CRISTOBAL AND MOUNT HOPE IN WET SEASONS OF 1918 AND 1919.

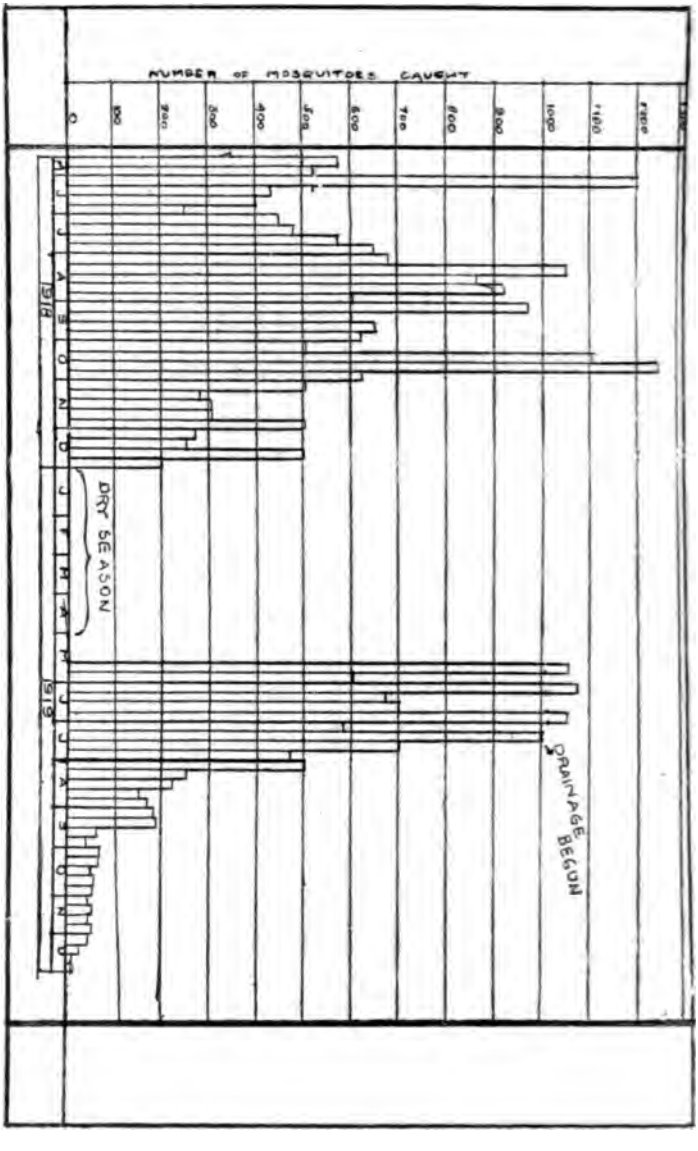


TABLE I—DISCHARGES, DEATHS, AND NONEFFECTIVE RATES FOR EMPLOYEES

ABSOLUTE NUMBERS.

	Number of employees.	Discharges from hospitals and deaths.			Deaths.			Noneffective from sickness.	
		Total.	Disease.	External causes.	Total.	Disease.	External causes.	Days treated.	Constantly noneffective.
Year, 1919:									
White	4,523	1,271	1,141	130	10	8	2	27,338	74.90
Colored	19,681	3,834	3,121	713	165	142	23	98,891	270.93
Total	24,204	5,105	4,262	843	175	150	25	126,229	345.83
Year, 1918:									
White	4,403	1,216	1,049	167	17	16	1	26,821	73.48
Colored	21,112	2,948	2,437	511	190	166	24	75,784	207.63
Total	25,520	4,164	3,486	678	207	182	25	102,605	281.11

PROPORTIONATE NUMBERS.

Year, 1919:									
White	4,523	281.01	252.27	28.79	2.21	1.77	0.44	.....	16.55
Colored	19,681	194.81	158.58	36.23	8.38	7.21	1.17	.....	13.77
Total	24,204	210.92	176.09	34.83	7.23	6.20	1.03	.....	14.29
Year, 1918:									
White	4,408	275.86	237.98	37.88	3.86	3.63	0.23	.....	16.67
Colored	21,112	139.64	115.43	24.21	9.00	7.86	1.14	.....	9.83
Total	25,520	163.17	136.60	26.57	8.11	7.13	.98	.....	11.02

TABLE II.—CAUSE OF DEATHS OF EMPLOYEES ARRANGED WITH REF-

Cause of death.	Color.		Age in years.				
	W.	B.	15–20	21–25	26–30	31–35	36–40
Malaria fever, estivoautumnal		1	1				
Malaria fever, mixed		1				1	
Influenza		1					
Pyemia		1				1	
Septicemia	1	2		1		1	1
Tuberculosis of the lungs		20		3	3	10	1
Acute miliary tuberculosis		1					1
Pott's disease		1					1
Disseminated tuberculosis		1			1		
Syphilis, tertiary	1						
Syphilis, period not stated	1	2		1		1	
Gonococcus infection		1					
Cancer of the stomach		1				1	
Cancer of other organs		2				1	
Anemia		1					
Chronic lead poisoning		1					
Simple meningitis	1	1			2		
Cerebrospinal fever		1			1		
Pneumococcus meningitis		1					
Other diseases of the spinal cord		1			1		
Apoplexy		10			2	1	1
Softening of the brain		3			1		1
Paralysis without specified cause		1					
Acute endocarditis		3	1	1		1	
Malignant endocarditis		1					
Organic diseases of the heart	2	16			2	2	4
Aneurysm		2				2	
Embolism and thrombosis		1					1
Broncho-pneumonia		4	1			1	
Pneumonia (unqualified)		1			1		
Lobar pneumonia	1	13			3	2	3
Ulcer of the stomach		2				1	
Other diseases of the stomach		1					
Diarrhea and enteritis		1				1	
Hernia, intestinal obstruction		2			2		
Other hernias		1	1				
Duodenal ulcer		1					
Cirrhosis of the liver		3			1		2
Abscess of liver		3				2	
Diseases of the spleen		1				2	1
Simple peritonitis		3				2	
Other diseases of the digestive system		1					1
Acute nephritis		6		1		4	1
Chronic nephritis		15			5	6	
Diseases of the bladder		1					
Acute abscess		1					
Diseases of the bones	1			1			
Arthritis		1		1			
External causes.							
Suicide by drowning		1				1	
Burns		1		1			
Accidental drowning	1	3		2	1		
Traumatism by fall		3			2		

OR, AGE, AND LENGTH OF RESIDENCE ON ISTHMUS.

td.

Length of residence on Isthmus (in years).

Unknown	Under 1 yr.	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–10	10–15	Over 15	Life.	Unknown.	Total.
													1	1
										1				1
							1							1
										1				1
									1	2				3
		1					1	1	2	9	2		4	20
									1		1			1
										1				1
										1				1
										1				1
					1				1				1	3
										1				1
											1			1
			1							1				2
										1				1
													1	1
	1											1		2
					1									1
									1					1
										1				1
	1									4	2	1	2	10
						1				2				3
										1				1
					1					1			1	3
										1				1
							2	1		11	2	1	1	18
									1				1	2
							1							1
									1	1	1	1		4
												1		1
		2			1					7	2	1	1	14
							1						1	2
									1					1
										1				1
							1						1	2
										1				1
													1	1
										1	1		1	3
			1				1	1						3
													1	1
									1	2				3
										1				1
										2	2	2		6
1						1		1	2	9	1		1	15
										1				1
													1	1
					1									1
			1											1
								1					1	1
		1	1							1			1	4
								1	1				1	3

TABLE II.—CAUSE OF DEATHS OF EMPLOYEES ARRANGED WITH REFERENCE

Cause of death.	Color.		Age in years.				
	W.	B.	15–20	21–25	26–30	31–35	36–40
Traumatism by machines		1					1
Traumatism by crushing		2		1			1
Railroad traumatism		1		1			
Starvation		1			1		
Homicide by cutting or piercing instruments		6		3	2	1	
Fractures	1		1				
Other external violence		4	1	1		1	
Cause of death not specified or ill-defined		3			1		1
Total	10	165	6	18	32	36	25

TO COLOR, AGE, AND LENGTH OF RESIDENCE ON THE ISTHMUS.—Continued.

Age in years—Contd.						Length of residence on Isthmus (in years)												
41–45	46–50	51–55	56–65	66–75	Unknown.	Under 1 yr.	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–10	10–15	Over 15	Life.	Unknown.	Total.
																		1	1
																		2	2
																		1	1
															1				1
								2									2	2	6
														1					1
	1														1		2	1	4
1								1						1	1				3
17	21	7	9	3	1	2	2	8	1	5	2	8	6	15	70	14	12	30	175

TABLE III.—DEATHS OF RESIDENTS OF THE CITIES OF PANAMA, COLON, AND THE CANAL ZONE.

Place.	Average population.	Deaths.			Annual rate per 1,000 population.		
		Total.	Disease.	External causes.	Total.	Disease.	External causes.
Year, 1919:							
Panama	61,369	1,211	1,165	46	19.73	18.98	0.75
Colon	26,078	573	536	37	21.97	20.55	1.41
Canal Zone[a]	26,511	229	207	22	8.64	7.81	0.83
Total	113,958	2,013	1,908	105	17.66	16.74	0.92
Year 1918:							
Panama	61,369	1,314	1,284	30	21.41	20.92	0.49
Colon	26,078	616	587	29	23.62	22.51	1.11
Canal Zone[a]	22,290	236	216	20	10.59	9.69	.90
Total	109,737	2,166	2,087	79	19.74	19.02	.72

[a] During the year 1918, and the first six months of 1919, military population was not included. Starting, July 1, 1919, military population is included in the statistics of the Canal Zone.

TABLE IV.—DEATHS OF POPULATION OF THE CANAL ZONE[1] AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
General diseases.									
Typhoid fever	2	2	....	4	....	....	....	....	....
Paratyphoid fever	....	1	....	1	....	....	....	....	....
Malaria	5	3	1	7	....	3	3	....	....
Estivoautumnal	6	2	1	7	....	1	3	....	1
Tertian	1	....	....	1	....	....	1	....	....
Mixed	1	....	....	1	....	....	....	....	....
Measles	1	....	....	1	....	....	....	1	....
Whooping cough	6	3	1	8	....	3	5	1	....
Diphtheria and croup	6	4	1	9	....	3	5	2	....
Influenza	3	1	1	3	....	....	....	....	2
Dysentery	2	4	1	5	....	1	....	1	....
Entamebic	1	1	....	2	....	....	....	....	....
Bacillary	1	2	2	1	....	1	1	....	....
Unclassified	2	....	....	2	....	....	2	....	....
Leprosy	2	....	1	1	....	....	....	....	....
Erysipelas	....	1	....	1	....	1	....	....	....
Purulent infection and septicemia	4	3	1	6	....	1	....	....	....
Pyemia	1	1	....	2	....	....	....	....	....
Septicemia	3	2	1	4	....	1	....	....	....
Tetanus	2	....	....	2	....	2	....	....	....
Pellagra	....	11	....	11	....	....	....	....	....
Beriberi	2	....	....	2	....	....	....	....	....
Tuberculosis of the lungs	171	133	21	277	6	3	5	5	22
Acute miliary tuberculosis	7	4	....	10	1	2	3	1	....
Tuberculous meningitis	8	6	4	10	....	3	5	2	....
Abdominal tuberculosis	4	4	1	7	....	....	1	1	2
Pott's disease	2	2	....	4	....	....	1	1	1
White swellings	1	....	....	1	....	....	1	....	....
Tuberculosis of other organs	1	....	....	1	....	....	1	....	....
Tuberculosis of the genito-urinary organs	1	....	1	....	....	....	....	....	....
Tuberculous abscess	1	....	....	1	....	....	....	....	....
Disseminated tuberculosis	10	9	....	19	....	3	2	....	....
Rickets	2	....	....	2	....	2	....	....	....
Syphilis:									
Tertiary	3	3	....	6	....	....	....	....	....
Cerebrospinal	1	....	1	....	....	....	....	....	....
Hereditary	7	7	1	13	....	13	1	....	....
Period not stated	6	2	1	7	....	3	1	....	....
Gonococcus infection	1	....	....	1	....	....	....	....	....
Cancer and other malignant tumors of the buccal cavity	2	1	2	1	....	....	....	....	....
Cancer and other malignant tumors of the stomach and liver	8	7	3	11	1	....	....	....	....
Cancer and other malignant tumors of the peritoneum, intestines, rectum	2	....	1	1	....	....	....	....	....
Cancer and other malignant tumors of the female genital organs	....	18	3	15	....	....	....	....	....
Cancer and other malignant tumors of the breast	....	1	....	1	....	....	....	....	....
Cancer and other malignant tumors of other organs and of organs not specified	10	4	3	11	....	....	....	1	1
Other tumors (tumors of the female genital organs excepted)	....	1	....	1	....	....	1	....	....
Scurvy	....	1	....	1	....	1	....	....	....
Diabetes	2	3	3	2	....	....	....	....	....
Leukemia	....	1	....	1	....	....	1	....	....
Leukemia lymphatic	....	1	....	1	....	....	1	....	....

[1] Including employees and nonemployees, civil population only, for period from January 1.

OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND NCE.

Age (in years)—Continued.						Place of residence.			
31–40	41–50	51–60	61–75	76–100	Age unknown.	Panama.	Colon.	Canal Zone.	Total.
						2	1	1	4
1						1			1
1						4	3	1	8
1						5	1	2	8
							1		1
1						1			1
							1		1
						7	2		9
						10			10
	1					1	3		4
1		1	1		1	5	1		6
		1				2			2
						1		2	3
						1	1		2
1						1		1	2
						1			1
1	1		1			3	4		7
1						2			2
3						4		1	5
						2			2
3	1	2				5	5	1	11
	2					2			2
92	40	14	9	2	2	206	82	16	304
3	1	1				5	6		11
						10	2	2	14
1	2					4	4		8
1						2	1	1	4
						1			1
						1			1
			1				1		1
								1	1
5	3					2	5	2	9
							2		2
	2					3	2	1	6
	1							1	1
						6	2	6	14
2			1			3	2	3	8
	1						1		1
		3				3			3
3	4	3	2	1		6	6	3	15
	1	1				2			2
2	8	5	1			13	3	2	18
1						1			1
4	3	2	1	1		9	3	2	14
						1			1
						1			1
	2		1			3		2	5
								1	1
								1	1

June 30, 1919; and also military population from July 1, 1919, to December 31, 1919.

TABLE IV.—DEATHS OF POPULATION OF THE CANAL ZONE[1] AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
General diseases.—Continued.									
Anemia, chlorosis		1		1		1			
Anemia, secondary, cause not determined	1			1					
Other general diseases		1	1						
Purpura hemorrhagica	2		1	1		1			
Alcoholism, acute	1		1						
Chronic lead poisoning	1			1					
Diseases of the nervous system and of the organs of special sense.									
Encephalitis	1	1		2			1		
Simple meningitis	9	6	5	10		5	5	1	
Cerebro-spinal fever	1			1					
Pneumococcus meningitis	8			8			1		1
Other diseases of the spinal cord	2	2		4					1
Cerebral hemorrhage, apoplexy	25	20	9	43	2				
Softening of the brain	3	2		5					
Paralysis without specified cause	6		1	5					
General paralysis of the insane	2			2					
Other forms of mental alienation	1	1		2					
Epilepsy	1	2	1	2					
Convulsions (nonpuerperal) 5 years and over	1			1					1
Convulsions of infants under 5 years of age	3	3		6		5	1		
Other diseases of the nervous system	2			2		1			
Diseases of the circulatory system.									
Pericarditis	2	2		4					1
Acute endocarditis	13	4	1	15	1	2	1	1	3
Malignant endocarditis	1	1		2					
Organic diseases of the heart	54	36	14	74	2	1	1		2
Angine pectoris		1	1						
Diseases of the arteries, atheroma, aneurysm, etc.	2	1		3					
Aneurysm	7		1	6					
Arterio-sclerosis	11	13	5	17	2				
Embolism and thrombosis	2	2		4					
Diseases of the lymphatic system (lymphangitis, etc.)	3	1		4		3	1		
Diseases of the respiratory system.									
Acute bronchitis	19	21	2	38		25	13		
Chronic bronchitis	10	4		14		9	4		
Broncho-pneumonia	102	71	14	157	2	71	53	7	17
Pneumonia (unqualified)	11	22	6	27		10	11	1	2
Lobar pneumonia	38	16	4	49	1	3		1	3
Pleurisy	3	2		5					1
Empyema	1	1		2					
Pulmonary congestion, pulmonary apoplexy	1	1		2					
Gangrene of the lungs	3	1	1	3					
Pulmonary emphysema		2	1	1				1	
Other diseases of the respiratory system (tuberculosis excepted)		1	1						

[1] Including employees and nonemployees, civil population only, for period from January 1,

CITIES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND RESIDENCE.—Continued.

Age (in years)—Continued.							Place of residence.			
21–30	31–40	41–50	51–60	61–75	76–100	Age unknown	Panama.	Colon.	Canal Zone.	Total
							1			1
		1					1			1
1							1			1
				1			1		1	2
	1						1			1
		1						1		1
			1					1	1	2
2	1	1					11	2	2	15
1							1			1
4		1	1				6	1	1	8
1		1		1			3	1		4
3	13	11	14	10	3		39	12	3	54
1	2	2					2	2	1	5
	3		3				3	2	1	6
	1	1					2			2
	2						1	1		2
1	2						2		1	3
							1			1
							4	1	1	6
	1							1	1	2
	1	1	1				4			4
1	7	1	1				14	2	1	17
1									2	2
11	17	28	14	9	6	1	37	46	7	90
					1				1	1
		1			1	1	2		1	3
1	3	2	1				4	1	2	7
	1	5	6	8	4		21	3		24
1	2		1				2	2		4
							3		1	4
1	1						14	25	1	40
					1		1	13		14
9	11	9	3	2	1		109	52	12	173
2	2	1	1	2		1	31	1	1	33
10	15	9	4	8	1		31	21	2	54
1			1	1		1	4	1		5
	2						2			2
	1			1			2			2
1	1		2				4			4
	1						1	1		2
				1			1			1

1919, to June 30, 1919, and also military population from July 1, 1919, to December 31, 1919.

TABLE IV.—DEATHS OF POPULATION OF THE CANAL ZONE* AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
Diseases of the digestive system.									
Ulcer of the stomach	7	...	...	7	...	1	...	...	...
Other diseases of the stomach (cancer excepted)	1	...	...	1	...	...	...	...	...
Acute gastritis	6	5	3	8	...	7	2	...	1
Acute indigestion	...	1	...	1	...	...	...	...	...
Diarrhea and enteritis (under two years)	106	95	12	188	1	152	49	...	...
Colitis (under two years)	8	3	1	10	...	9	2	...	...
Diarrhea and enteritis (two years and over)	9	7	2	14	...	...	7	...	1
Colitis (two years and over)	2	1	...	2	1	...	...	1	...
Ankylostomiasis	...	1	...	1	...	...	...	...	...
Ascariasis	...	1	1	...	...	...	...	...	...
Appendicitis and typhlitis	2	...	1	1	...	...	...	...	...
Acute appendicitis	...	2	1	1	...	...	...	1	...
Hernia, intestinal obstruction	4	2	...	6	...	...	...	...	...
Inguinal hernia	1	...	...	1	...	...	...	...	...
Other hernias	2	...	...	2	...	...	...	...	1
Intestinal obstruction	2	2	...	4	...	1	...	...	...
Other diseases of the intestines	...	2	...	2	...	...	...	...	...
Duodenal ulcer	3	...	...	3	...	...	1	...	...
Cirrhosis of the liver	12	6	...	18	...	5	...	...	...
Biliary calculi	...	1	...	1	...	1	...	...	...
Other diseases of the liver	1	1	...	2	...	...	1	...	...
Abscess of liver, (unqualified)	5	1	1	5	...	...	1	...	...
Abscess of the liver, entamebic	4	1	...	4	1	...	...	...	...
Cholecystitis	...	3	...	3	...	1	...	...	...
Diseases of the spleen	1	...	...	1	...	...	...	...	...
Simple peritonitis (nonpuerperal)	12	6	1	17	...	...	...	...	1
Other diseases of the digestive system (cancer and tuberculosis excepted)	1	...	...	1	...	...	...	...	...
Nonvenereal diseases of the genito-urinary system and annexa.									
Acute nephritis	25	17	2	39	1	11	12	1	2
Bright's disease (chronic nephritis)	79	35	6	106	2	2	4	1	1
Other diseases of the kidney and annexa	3	1	...	4	...	1	2	...	1
Pyelo-nephrosis	3	3	...	6	...	2	...	...	1
Diseases of the bladder	1	1	1	1	...	...	...	...	...
Cystitis	...	1	...	1	...	...	...	...	...
Diseases of the urethra, urinary abscess, etc.	1	...	...	1	...	...	...	...	...
Nonvenereal diseases of the male genital organs	1	...	...	1	...	...	...	...	...
Salpingitis and other diseases of the female genital organs	...	2	...	2	...	...	...	...	2
The puerperal state.									
Hyperemesis gravidarum	...	1	...	1	...	...	...	...	...
Puerperal hemorrhage	...	3	...	3	...	...	...	...	...
Puerperal septicemia	...	3	...	3	...	...	...	...	...
Puerperal albuminuria and convulsions	...	2	1	1	...	...	...	...	...
Eclampsia	...	5	...	5	...	...	...	...	...
Diseases of the skin and of the cellular tissue.									
Carbuncle	...	1	...	1	...	...	1	...	...
Acute abscess	...	1	...	1	...	1	...	...	...
Phlegmon and cellulitis	1	...	...	1	...	...	...	...	...

*Including employees and nonemployees, civil population only, for period from January 1,

CITIES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND RESIDENCE.—Continued.

Age (in years)—Continued.							Place of residence.			
21–30	31–40	41–50	51–60	61–75	76–100	Age unknown	Panama.	Colon.	Canal Zone.	Total.
1	1	3	.....	1	.....	....	2	5	.....	7
.....	.....	1	.....	.....	.....	.....	.....	1	.....	1
.....	.....	.....	1	.....	.....	.....	11	.....	.....	11
.....	.....	1	.....	.....	.....	.....	.....	1	.....	1
.....	.....	.....	.....	.....	.....	.....	131	50	20	201
.....	.....	.....	.....	.....	.....	.....	5	2	4	11
1	2	1	1	3	.....	.....	13	3	.....	16
.....	.....	2	.....	.....	.....	.....	3	.....	.....	3
1	.....	.....	.....	.....	.....	.....	1	.....	.....	1
.....	1	.....	.....	.....	.....	.....	1	.....	.....	1
1	.....	1	.....	.....	.....	.....	1	.....	1	2
.....	1	.....	.....	.....	.....	.....	1	.....	1	2
3	2	.....	1	.....	.....	.....	3	2	1	6
.....	.....	.....	.....	1	.....	.....	1	.....	.....	1
.....	.....	.....	.....	1	.....	.....	1	.....	1	2
.....	2	.....	.....	1	.....	.....	3	1	.....	4
1	.....	1	.....	.....	.....	.....	2	.....	.....	2
.....	1	1	.....	.....	.....	.....	2	1	.....	3
3	3	5	1	.....	1	.....	11	4	3	18
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
1	.....	.....	.....	.....	.....	.....	2	.....	.....	2
1	1	2	1	.....	.....	.....	4	2	.....	6
.....	3	1	1	.....	.....	.....	1	3	1	5
1	1	.....	.....	.....	.....	.....	3	.....	.....	3
.....	1	.....	.....	.....	.....	.....	.....	1	.....	1
2	6	5	3	1	.....	.....	11	5	2	18
.....	1	.....	.....	.....	.....	.....	1	.....	.....	1
8	5	3	.....	.....	.....	.....	21	9	12	42
12	29	29	20	11	4	1	64	47	4	114
.....	.....	.....	.....	.....	.....	.....	3	.....	1	4
1	1	1	.....	.....	.....	.....	5	1	.....	6
.....	.....	1	1	.....	.....	.....	2	.....	.....	2
.....	.....	1	.....	.....	.....	.....	.....	1	.....	1
.....	1	.....	.....	.....	.....	.....	.....	1	.....	1
.....	.....	1	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	1	1	.....	2
1	.....	.....	.....	.....	.....	.....	.....	1	.....	1
2	1	.....	.....	.....	.....	.....	2	.....	1	3
3	.....	.....	.....	.....	.....	.....	3	.....	.....	3
2	.....	.....	.....	.....	.....	.....	.....	1	1	2
3	2	.....	.....	.....	.....	.....	1	3	1	5
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
1	.....	.....	.....	.....	.....	.....	.....	1	.....	1

1919, *to June 30, 1919, and also military* population from July 1, 1919, to December 31, 1919.

TABLE IV.—DEATHS OF POPULATION OF THE CANAL ZONE* AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
Diseases of the bones and of the organs of locomotion.									
Diseases of the bones (tuberculosis excepted)	1	....	1	....	....	....	....	....	....
Mastoid abscess	1	....	1	....	....	....	....	....	....
Arthritis	1	....	....	1	....	....	....	....	....
Malformations.									
Congenital malformations (stillbirth not included)	9	13	6	16	....	20	2	....	....
Diseases of early infancy.									
Newborn child	1	2	....	3	....	3	....	....	....
Congenital debility, icterus, and sclerema	7	5	....	11	1	12	....	....	....
Premature birth	31	21	6	46	....	52	....	....	....
Congenital debility	3	1	1	2	1	4	....	....	....
Atrophy of infants	1	1	....	2	....	2	....	....	....
Malnutrition	33	19	1	51	....	52	....	....	....
Other causes peculiar to early infancy (including various consequences of labor)	16	13	3	26	....	28	....	....	....
Old age.									
Senility	....	8	2	6	....	....	....	....	....
Affections produced by external causes.									
Suicide by hanging or strangulation	1	....	1	....	....	....	....	....	....
Suicide by firearms	2	....	1	1	....	....	....	....	....
Acute poisonings	4	1	1	4	....	2	1	....	....
Burns (conflagration excepted)	4	2	....	6	....	2	3	....	....
Absorption of deleterious gases (conflagration excepted)	1	....	....	1	....	....	1	....	....
Accidental drowning	19	....	6	13	....	....	....	1	4
Traumatism by firearms	2	....	....	2	....	....	....	....	1
Traumatism by cutting or piercing instruments	1	....	1	....	....	....	....	....	....
Traumatism by fall	14	5	2	17	....	1	6	2	2
Traumatism by machines	1	....	....	1	....	....	....	....	....
Traumatism by other crushings, (vehicles, railroads, landslides, etc.)	12	....	2	10	....	....	....	3	2
Railroad traumatism	3	....	....	3	....	....	....	....	....
Traumatism by landslides	1	....	....	1	....	....	....	....	1
Starvation	1	....	....	1	....	....	....	....	....
Effects of heat	1	....	1	....	....	....	....	....	....
Lightning	1	....	....	1	....	....	....	....	....
Homicide by firearms	6	1	4	3	....	....	....	....	....
Homicide by cutting or piercing instruments	7	....	....	7	....	....	....	....	....
Fractures (cause not specified)	6	1	1	6	....	....	....	4	....
Other external violence	7	1	....	8	....	1	....	1	1
Ill-defined diseases.									
Cause of death not specified or ill-defined	22	21	3	40	....	7	22	1	2
Infections of undetermined origin	4	....	1	3	....	1	2	....	....
Total	1181	832	205	1782	26	563	254	44	78

*Including employees and nonemployees, civil population only, for period from January 1.

TES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND SIDENCE.—Continued.

Age (in years)—Continued.							Place of residence.			
-30	31-40	41-50	51-60	61-75	76-100	Age unknown	Panama.	Colon.	Canal Zone.	Total.
1									1	1
1							1			1
1							1			1
							8	6	8	22
							3			3
							10	1	1	12
							25	19	8	52
							3	1		4
							1	1		2
							23	10	19	52
						1	19	4	6	29
				1	7		7	1		8
	1								1	1
	2							2		2
	1	1					4	1		5
1							2	1	3	6
							1			1
6	4	2	1	1			5	7	7	19
			1				1		1	2
1								1		1
5	1	2					9		2	13
	1						1			1
3	3			1			6	5	1	12
2		1						1	2	3
							1			1
1								1		1
1									1	1
1							1			1
4	1	1				1	2	3	2	7
5	2						1	5	1	7
3							6		1	7
2	2	1					6	2		8
2	3	5			1		25	7	11	43
	1						1	1	2	4
97	306	223	119	84	35	10	1,211	573	229	2,013

), *to June 30, 1919, and also military* population from July 1, 1919, to December 31, 1919.

TABLE IV-A.—DEATHS

Cause of death.	Sex.		Color.		Less than 1 year.
	M.	F.	W.	B.	
Typhoid fever	4	.....	3	1	.....
Malaria	1	1	1	1	.....
Diphtheria and croup	.....	1	.....	1	.....
Dysentery	4	1	.....	5	.....
Yellow fever	2	.....	2	.....	.....
Septicemia	.....	1	.....	1	.....
Pellagra	1	.....	.....	1	.....
Tuberculosis of the lungs	21	8	3	26	.....
Abdominal tuberculosis	.....	1	1	.....	.....
White swellings	1	.....	1	.....	.....
Tuberculosis of other organs	.....	1	1	.....	.....
Cancer of the stomach	3	.....	1	2	.....
Cancer, female genital organs	.....	1	.....	1	.....
Leukemia	1	.....	1	.....	.....
Anemia, chlorosis	.....	1	1	.....	.....
Anemia, secondary	.....	1	1	.....	.....
Simple meningitis	1	.....	1	.....	.....
Pneumococcus meningitis	1	.....	.....	1	.....
Other diseases of the spinal cord	1	1	1	1	.....
Apoplexy	2	.....	.....	2	.....
Softening of the brain	1	.....	.....	1	.....
General paralysis of the insane	2	.....	.....	2	.....
Organic diseases of the heart	8	1	.....	9	.....
Diseases of the arteries	1	.....	.....	1	.....
Aneurysm	1	.....	1	.....	.....
Arteriosclerosis	2	.....	1	1	.....
Embolism and thrombosis	1	.....	1	.....	1
Diseases of the thyroid body	1	.....	.....	1	.....
Broncho-pneumonia	6	2	3	5	1
Pneumonia (unqualified)	1	.....	.....	1	.....
Lobar pneumonia	14	1	5	10	1
Pleurisy	.....	1	.....	1	.....
Empyema	2	.....	1	1	.....
Gangrene of the lungs	1	.....	.....	1	.....
Abscess of the lungs	1	.....	.....	1	.....
Ulcer of the stomach	1	.....	.....	1	.....
Diarrhea and enteritis	2	3	.....	5	.....
Acute appendicitis	2	.....	.....	2	.....
Hernia, intestinal obstruction	2	.....	.....	2	1
Cirrhosis of the liver	3	2	.....	5	.....
Abscess of the liver (unqualified)	3	.....	1	2	.....
Simple peritonitis	1	.....	.....	1	.....
Acute nephritis	.....	1	.....	1	.....
Chronic nephritis	14	3	4	13	.....
Other diseases of the kidney	1	.....	.....	1	.....
Chronic prostatitis	1	.....	1	.....	.....
Abscess of the prostate	1	.....	1	.....	.....
Puerperal septicemia	.....	1	1	.....	.....
Eclampsia	.....	1	.....	1	.....
Carbuncle	1	.....	.....	1	.....
Congenital malformations	1	.....	.....	1	1
Congential debility, icterus, and sclerema	.....	2	.....	2	2
Premature birth	1	1	.....	2	2
Malnutrition	1	.....	.....	1	1
Suicide by drowning	2	.....	2	.....	.....
Burns (conflagration excepted)	1	.....	1	.....	.....
Absorption of deleterious gases	1	.....	.....	1	.....

"Includes deaths of all nonresidents, passengers off incoming ships, etc.
Deaths of nonresidents are not taken up in the statistical charts relating to Panama, Colon

OF NONRESIDENTS."

Age (in years).									Total.
1–4	5–10	11–20	21–30	31–40	41–50	51–60	61–75	76–80	
		1		2	1				4
			1		1				2
	1								1
		1		1		3			5
		1			1				2
			1						1
				1					1
			13	7	5	3	1		29
	1								1
					1				1
						1			1
				1			2		3
				1					1
			1						1
					1				1
			1						1
		1							1
		1							1
		1		1					2
					2				2
								1	1
				1	1				2
			2	2	2	3			9
						1			1
						1			1
				1	1				2
									1
						1			1
1	1	1	2		2				8
					1				1
		2	2	1	7	1	1		15
1									1
		1		1					2
					1				1
					1				1
					1				1
1			1	1	1		1		5
				2					2
				1					2
				2	2	1			5
					1	1	1		3
				1					1
		1							1
			3	4	6	2		2	17
					1				1
							1		1
					1				1
			1						1
			1						1
						1			1
									1
									2
									2
									1
			1				1		2
				1					1
			1						1

and the Canal Zone.

TABLE IV-A.—DEATHS

Cause of death.	Sex.		Color.		Less than 1 year.
	M.	F.	W.	B.	
Accidental drowning	6	.....	3	3	.....
Traumatism by fall	1	.....	1	.....	.....
Injuries by animals	1	.....	.....	1	.....
Effects of heat	1	.....	1	.....	.....
Homicide by firearms	2	.....	1	1	.....
Electrocution, accidental	1	.....	1	.....	.....
Other external violence	1	.....	.....	1	.....
Ill-defined or undetermined	1	1	1	1	.....
Infections of undetermined origin	1	.....	.....	1	.....
Total	139	38	49	128	10

[a]Includes deaths of all nonresidents, passengers off incoming ships, etc.
Deaths of nonresidents are not taken up in the statistical charts relating to Panama, Colon,

OF NONRESIDENTS[1]—Continued.

Age (in years).									Total.
1–4	5–10	11–20	21–30	31–40	41–50	51–60	61–75	76–80	
... ..	... ..	.....	3	2	1	.....	.....	.. ..	6
... ..	.....	.....	.....	1	... ...	.....	.....	...	1
...	.....	1	... ...	... ...	.....	.....	.....	.....	1
... ...	.....	... ..	1	.....	.....	... ...	... ...	.....	1
... ..	.....	.....	1	.....	1	... ...	.. ....	.....	2
...	... ..	.....	1	.....	... ..	.....	.....	.....	1
.....	....	.....	.....	1	.....	.....	.....	.....	1
.....	.....	.....	....	1	1	.....	.....	.....	2
.....	.....	.....	.....	... ..	1	.....	.....	.....	1
3	3	12	38	36	45	19	8	3	177

and the Canal Zone.

TABLE V.—DEATHS BY NATIONALITY OR NATIVITY.

Country.	Employees.		Nonemployees.		Total.		Grand total.
	Male.	Female.	Male.	Female.	Male.	Female.	
Antigua	5		11	7	16	7	23
Antilles	1		1		2		2
Algeria			1		1		1
Austria			1		1		1
Barbados	40		174	128	214	128	342
Bavaria	1				1		1
Brazil			1		1		1
Bahamas			2		2		2
British Guiana	1		2	3	3	3	6
Chile			4		4		4
China	1		22	4	23	4	27
Colombia	8		57	42	65	42	107
Costa Rica	1		1	2	2	2	4
Cuba			1	2	1	2	3
Curaçao			1		1		1
Demerara			4	4	4	4	8
Dominica	1		1	2	2	2	4
Dutch West Indies	1				1		1
England			3	2	3	2	5
Ecuador	1		4	3	5	3	8
France			4	3	4	3	7
Finland			1		1		1
Fortune Island	1		2		3		3
Grenada	2		16	12	18	12	30
Greece			5	1	5	1	6
Guadeloupe	5		13	3	18	3	21
Grand Caymon			1		1		1
Germany			1		1		1
Guatemala				1		1	1
Haiti	2				2		2
Honduras				1		1	1
India			2	1	2	1	3
Italy			6	2	6	2	8
Ireland			1	3	1	3	4
Jamaica	58		253	243	311	243	554
Japan			2	1	2	1	3
Martinique	6		33	13	39	13	52
Mexico			3		3		3
Montserrat	1		6	3	7	3	10
Nicaragua	3			4	3	4	7
Nassau			2	2	2	2	4
Panama	10		271	274	281	274	555
Peru	3		17	4	20	4	24
Porto Rico			3	4	3	4	7
St. Andrews			1	1	1	1	2
St. Kitts	1				1		1
St. Lucia	4		16	10	20	10	30
St. Thomas	3		2	1	5	1	6
St. Vincent	4		5	4	9	4	13
Scotland			1		1		1
Spain	2		16	8	18	8	26
Sweden			1	1	1	1	2
Trinidad	2		7	12	9	12	21
United States	6		19	11	25	11	36
Veraguas				1		1	1
Venezuela	1		4	7	5	7	12
Virgin Islands				2		2	2
Unknown			1		1		1
Total	175		1,006	832	1,181	832	2,013

TABLE VI.—STATISTICS RE AMERICAN EMPLOYEES AND THEIR FAMILIES

	Annual death rate per 1,000 population.
White employees from the United States:	
Disease	1.08
External causes	.26
Total	1.34
White women and children from the United States:	
Disease	3.31
External causes	.19
Total	3.50
White employees from the United States and their families:	
Disease	2.36
External causes	.22
Total	2.58
Number of American children born on Isthmus during year 1919	215
Deaths among American children under 1 year of age	10
Infant mortality rate among American children (number of deaths per 1,000 births)	44.44

TABLE VII.—BIRTHS AND BIRTH RATES IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

Place.	Average population.	Births.			Rate per 1,000 population.		
		Total.	Alive.	Still-born.	Total.	Alive.	Still-born.
Year, 1919:							
Panama	61,369	2,359	2,214	145	38.44	36.08	2.36
Colon	26,078	964	908	56	36.97	34.82	2.15
Canal Zone [1]	26,511	732	695	37	27.61	26.22	1.39
Total	113,958	4,055	3,817	238	35.58	33.50	2.09
Year, 1918:							
Panama	61,369	2,472	2,308	164	40.28	37.61	2.67
Colon	26,078	861	795	66	33.02	30.48	2.52
Canal Zone [1]	22,290	770	725	45	34.73	32.69	2.04
Total	109,737	4,103	3,828	275	37.39	34.88	2.51

[1] During the year 1918 and the first six months of 1919 military population was not included. Starting July 1, 1919, military population is included in statistics of the Canal Zone.

TABLE VIII.—INFANT MORTALITY RATES IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

Place.	Average population.	Births.			Deaths among children under 1 year of age.	Death rate per 1,000 births.
		Male.	Female.	Total.		
Year, 1919:						
Panama	61,369	1,190	1,024	2,214	342	154.47
Colon	26,078	479	429	908	141	155.29
Canal Zone	26,511	355	340	695	79	113.67
Total	113,958	2,024	1,793	3,817	562	147.24
Year, 1918:						
Panama	61,369	1,205	1,103	2,308	412	178.59
Colon	26,078	418	377	795	148	186.16
Canal Zone	22,290	353	372	725	60	82.76
Total	109,737	1,976	1,852	3,828	620	161 96

TABLE IX.—DEATHS OF INFANTS BY CAUSE.

Cause of death.	Sex.		Color.		—1 week.	+1 week —1 month.
	M.	F.	W.	B.		
Malaria	...	3	1	2	...	...
Malaria fever, estivoautumnal	1	...	...	1	...	...
Whooping cough	3	...	1	2	...	...
Diphtheria and croup	1	1	...	2	...	...
Dysentery	...	1	...	1	...	...
Dysentery, bacillary	1	...	1	...	...	...
Erysipelas	...	1	...	1	...	...
Purulent infection and septicemia	1	...	...	1	...	...
Septicemia	...	1	...	1	...	...
Tetanus	2	...	...	2	1	1
Tuberculosis of the lungs	2	1	...	3	...	...
Acute miliary tuberculosis	2	...	...	2	...	...
Tuberculous meningitis	2	1	1	2	...	...
Disseminated tuberculosis	2	1	...	3	...	...
Rickets	2	...	...	2	...	...
Syphilis, hereditary	7	6	1	12	5	...
Syphilis, period not stated	1	2	...	3	1	...
Scurvy	...	1	...	1	...	...
Anemia, chlorosis	...	1	...	1	...	...
Purpura, hemorrhagica	1	...	...	1	1	...
Simple meningitis	2	3	2	3	...	...
Convulsion of infants	3	2	...	5	3	1
Diseases of the nervous system	1	...	...	1	...	...
Acute endocarditis	1	1	...	2	...	...
Organic disease of the heart	1	...	...	1	1	...
Diseases of lymphatic system	2	1	...	3	...	...
Acute bronchitis	11	13	1	23	4	1
Chronic bronchitis	6	3	...	9	...	...
Broncho-pneumonia	39	33	4	68	2	4
Pneumonia (unqualified)	3	7	4	6	...	1
Lobar pneumonia	1	2	1	2	...	...
Ulcer of the stomach	1	...	...	1	...	...
Acute gastritis	6	1	3	4	1	...
Acute indigestion	...	1	...	1	...	...
Diarrhea and enteritis	80	72	7	145	6	2
Colitis	7	2	1	8	...	...
Intestinal obstruction	1	...	...	1	...	...
Cirrhosis of the liver	3	2	...	5	...	...
Biliary calculi	...	1	...	1	...	...
Cholecystitis	...	1	...	1	1	...
Acute nephritis	7	4	1	10	...	...
Chronic nephritis	1	1	...	2	...	...
Other diseases of the kidneys	1	...	...	1	...	...
Pyelo nephrosis	2	...	...	2	...	...
Acute abscess	...	1	...	1	...	...
Congenital malformations	9	11	6	14	8	4
Congenital debility, icterus and sclerema	8	7	...	15	13	1
Premature birth	30	21	6	45	48	2
Congenital debility	3	1	1	3	1	1
Atrophy of infants	1	1	...	2	...	...
Malnutrition	31	19	1	49	2	6
Causes peculiar to early infancy	16	12	3	25	26	2
Acute poisoning	2	...	...	2	...	...
Burns	1	1	...	2	...	...
Other external violence	1	...	...	1	1	...
Traumatism by fall	...	1	...	1	...	...
Cause of death not specified or ill-defined	2	5	...	7	...	1
Infection of undetermined origin	1	...	...	1	...	...
Total	312	250	46	516	125	27

SEX, COLOR, AGE, AND PLACE OF RESIDENCE.

Age (by months).											Place of residence.			
1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	Panama	Colon.	Canal Zone.	Total.
....	....	....	....	1	....	1	....	1	....	....	2	1	.....	3
....	....	....	....	....	....	....	....	1	....	....	1	.....	.....	1
....	1	....	....	....	....	....	....	1	....	1	2	1	.....	3
....	....	....	....	....	....	....	1	....	....	1	2	.....	.....	2
....	....	....	....	....	....	....	....	....	1	....	.....	1	.....	1
....	1	....	....	....	....	....	....	....	....	....	.....	.....	1	1
1	....	....	....	....	....	....	....	....	....	....	1	.....	.....	1
....	....	....	....	1	....	....	....	....	....	....	1	.....	.....	1
1	....	....	....	....	....	....	....	....	....	....	1	.....	.....	1
....	....	1	....	....	....	....	1	1	....	....	2	.....	.....	2
....	....	....	....	....	....	1	....	....	1	....	2	.....	.....	2
....	....	....	....	....	....	....	....	1	1	1	3	.....	.....	3
....	....	....	....	1	....	....	....	1	....	1	1	2	.....	3
....	....	....	....	....	....	....	....	....	2	....	.....	2	.....	2
2	4	1	....	....	....	1	....	....	....	....	6	4	3	13
1	....	....	....	1	....	....	....	....	....	....	1	2	.....	3
....	....	....	....	....	....	....	....	....	....	1	1	.....	.....	1
....	....	....	....	....	....	....	....	....	....	1	1	.....	.....	1
....	....	....	....	....	....	....	....	....	....	....	.....	.....	1	1
2	1	....	....	....	....	....	....	1	1	....	3	1	1	5
1	....	....	....	....	....	....	....	....	....	....	4	1	.....	5
....	....	....	1	....	....	....	....	....	....	....	.....	1	.....	1
1	....	....	....	1	....	....	....	....	....	....	2	.....	.....	2
....	....	....	....	....	....	....	....	....	....	....	1	.....	.....	1
....	....	....	1	....	1	....	....	....	....	1	3	.....	.....	3
2	....	1	3	....	2	2	4	1	....	4	9	14	1	24
1	3	....	1	1	1	....	1	....	1	....	....	9	....	9
6	4	4	6	3	6	8	12	6	7	4	49	17	6	72
....	1	....	1	....	....	1	2	3	....	1	10	.....	.....	10
....	2	....	....	....	....	....	....	1	....	....	3	.....	.....	3
....	....	....	....	....	....	....	1	....	....	....	1	.....	.....	1
1	1	1	1	....	....	....	....	....	1	1	7	.....	.....	7
1	....	....	....	....	....	....	....	....	....	....	.....	1	.....	1
13	12	12	16	10	17	9	21	14	8	12	100	36	16	152
....	....	1	1	1	3	1	1	....	1	....	4	1	4	9
....	....	....	....	....	....	....	....	1	....	....	1	.....	.....	1
....	1	1	....	....	....	2	1	....	....	....	.....	2	3	5
....	1	....	....	....	....	....	....	....	....	....	1	.....	.....	1
....	....	....	....	....	....	....	....	....	....	....	1	.....	.....	1
3	....	....	....	1	2	1	....	1	1	2	8	1	2	11
....	....	....	....	1	....	1	....	....	....	....	.....	2	.....	2
....	....	....	1	....	....	....	....	....	....	....	1	.....	.....	1
....	....	....	....	1	....	1	....	....	....	....	1	1	.....	2
....	1	....	....	....	....	....	....	....	....	....	1	.....	.....	1
1	1	....	....	....	1	1	2	1	1	....	8	5	7	20
....	....	1	....	....	....	....	....	....	....	....	13	1	1	15
1	....	....	....	....	....	....	....	....	....	....	25	18	8	51
....	....	....	....	....	....	1	....	....	1	....	3	1	.....	4
....	....	....	....	....	1	....	....	....	....	1	1	1	.....	2
7	5	4	2	2	5	6	1	4	2	4	23	9	18	50
....	....	....	....	....	....	....	....	....	....	....	19	4	5	28
1	....	....	....	....	1	....	....	....	....	....	2	.....	.....	2
....	....	....	....	....	1	....	....	....	1	....	1	.....	1	2
....	....	....	....	....	....	....	....	....	....	....	1	.....	.....	1
1	....	....	....	....	....	....	....	....	....	....	.....	1	.....	1
2	....	1	....	....	....	1	....	....	1	1	7	.....	.....	7
....	....	....	1	....	....	....	....	....	....	....	.....	.....	1	1
49	39	28	35	25	41	38	48	39	31	37	342	141	79	562

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
General diseases.								
Typhoid fever	...	...	3	1	...	...	...	...
Typhoid bacillus carrier	...	...	1	...	...	...	...	...
Paratyphoid fever	...	...	2	...	...	...	...	...
Malaria fever	1	...	2	...	...	...	...	...
Estivoautumnal	83	6	332	8	...	...	1	...
Tertian	40	3	97	9	...	...	...	...
Quartan	1	...	5	...	...	...	...	...
Mixed	...	...	2	...	...	...	1	...
Undetermined	4	...	51	14	...	...	...	...
Clinical	6	...	10	1	...	...	...	...
Cachexia	...	...	1	...	...	...	...	...
Hemoglobinuric fever, malarial	...	...	...	...	...	...	...	...
Smallpox	2	...	4	...	...	...	...	...
Varioloid	2	...	...	...	...	...	...	...
Vaccinia	...	...	...	...	...	...	...	...
Measles	...	...	6	1	...	...	...	...
Scarlet fever	...	...	...	...	...	...	...	...
Whooping cough	...	...	...	...	...	...	...	...
Diphtheria and croup	...	...	1	...	...	...	...	...
Croup	...	...	...	...	...	...	...	...
Diphtheria bacillus carrier	...	...	...	...	...	...	...	...
Influenza	120	8	175	1	...	...	1	...
Cholera nostras	1	...	...	...	...	...	...	...
Dysentery:								
Entamebic	12	...	5	...	...	...	...	...
Bacillary	...	...	...	...	...	...	...	...
Unclassified	...	...	1	...	...	...	...	...
Yellow fever	...	...	...	...	...	...	...	...
Leprosy	...	...	1	...	...	...	...	...
Erysipelas	4	...	...	...	...	...	1	...
Chicken pox	...	1	25	...	...	...	...	...
German measles	...	...	...	...	...	...	...	...
Mumps	...	...	1	...	...	...	...	...
Filariasis	...	...	...	...	...	...	...	...
Purulent infection and septicemia	2	1	3	...	...	...	...	...
Septicemia	1	...	1	...	...	...	3	...
Tetanus	...	...	...	...	...	...	...	...
Pellagra	...	...	...	...	...	...	...	...
Beriberi	...	...	...	...	...	...	...	...
Tuberculosis of the lungs	11	...	39	1	...	...	15	...
Acute miliary tuberculosis	...	...	...	...	...	...	...	...

OF THE PANAMA CANAL FOR THE YEAR, 1919.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White.		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
....	1	4	....	4	..	....	....	....	1	6	1	....	....	3	..	....	..	20	4
....	....	....	....	2	..	....	....	....	....	1	....	....	....	....	..	....	..	4	....
....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	..	....	..	2	....
....	2	....	....	....	..	....	....	....	....	....	....	....	....	....	..	....	..	5	....
166	38	31	28	63	1	1	....	....	2	18	1	4	....	....	..	....	..	778	5
93	20	33	13	22	..	....	....	1	....	5	....	3	....	....	..	....	..	328	1
3	1	....	....	1	..	....	....	....	....	1	....	....	....	....	..	....	..	12	....
....	....	1	....	....	..	....	....	....	....	1	....	....	....	....	..	....	..	4	1
15	....	2	3	2	..	....	....	....	....	1	....	....	....	....	..	....	..	92	....
9	3	1	1	3	..	....	....	....	....	1	....	1	....	....	..	....	..	36	....
....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	..	....	..	1	....
....	....	1	....	1	..	....	....	....	....	....	....	....	....	....	..	....	..	2	....
....	1	1	21	32	..	....	....	....	....	2	....	....	....	....	..	....	..	63	....
....	....	1	1	....	..	....	....	....	....	....	....	....	....	....	..	....	..	4	....
....	....	....	3	....	..	....	....	....	....	....	....	....	....	....	..	....	..	3	....
12	15	10	15	9	..	....	....	....	....	1	4	....	....	....	..	....	..	73	....
....	....	1	....	....	..	....	....	....	....	....	....	....	....	....	..	....	..	1	....
....	3	3	2	2	..	....	....	....	2	....	....	....	....	....	..	....	..	10	2
1	10	3	8	12	..	....	....	1	....	....	2	....	....	....	..	....	..	37	1
....	....	....	....	1	..	....	....	....	....	....	....	....	....	....	..	....	..	1	....
....	3	1	....	2	..	....	....	....	....	....	....	....	....	....	..	....	..	6	....
62	26	38	8	9	..	....	1	....	....	72	2	6	....	....	..	....	..	527	2
....	....	....	....	....	..	....	....	....	....	....	....	....	....	....	..	....	..	1	....
10	2	3	....	4	..	....	....	....	....	7	....	....	....	....	..	....	..	43	....
2	1	....	....	....	..	....	1	1	....	1	....	1	....	....	..	....	..	5	2
....	....	....	....	....	..	....	....	1	....	1	....	....	....	....	..	....	..	2	1
....	....	....	....	....	..	....	....	....	....	....	....	....	....	2	..	....	..	....	2
....	1	....	....	1	..	....	....	....	....	1	....	....	1	....	..	....	..	5	....
1	1	....	1	....	..	....	....	....	....	1	....	....	....	....	..	....	..	8	1
2	2	12	11	15	..	....	....	....	....	....	....	....	....	....	..	....	..	68	....
....	....	....	....	1	..	....	....	....	....	....	....	....	....	....	..	....	..	1	....
6	....	2	1	....	..	....	....	....	....	6	....	....	....	....	..	....	..	16	....
1	....	....	1	....	..	....	....	....	....	....	....	....	....	....	..	....	..	2	....
1	....	1	1	....	..	....	....	1	1	1	....	....	....	....	..	....	..	10	2
....	....	....	....	....	..	....	....	1	1	....	....	....	....	....	..	....	..	2	5
....	....	....	1	1	..	....	....	....	....	....	....	....	....	....	..	....	..	2	....
1	....	....	....	1	..	....	....	....	5	....	....	....	....	....	..	....	..	2	5
....	....	2	2	2	..	....	....	....	....	....	....	....	....	....	..	....	..	6	....
18	4	4	5	14	..	2	....	7	21	7	....	1	....	1	..	2	..	104	48
....	....	....	....	....	..	....	....	2	1	1	....	....	....	....	..	....	..	1	3

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
General diseases.—Continued.								
Tuberculous meningitis								
Abdominal tuberculosis								
Pott's disease							1	
Tuberculosis of bones and joints			3					
Tuberculosis of other organs								
Tuberculosis of the larynx								
Tuberculosis of the skin								
Tuberculosis of the lymph glands			2					
Tuberculosis of the genitourinary organs			1					
Tuberculous abscess			1					
Disseminated tuberculosis							1	
Rickets								
Syphilis:								
Primary	1		6	2				
Secondary	1		5	1				
Tertiary	17		178	5				
Cerebro-spinal	6		12		1			
Hereditary								
Period not stated			5					
Gonococcus infection	1						1	
Gonorrhea	16		131	9				
Gonorrheal arthritis			1	3				
Gonorrheal bubo								
Gonorrheal orchitis and epididymitis	1		23	5				
Gonorrheal ophthalmia			1					
Soft chancre	11		76	12				
Adenitis, chancroidal	1		5					
Cancer and other malignant tumors of the buccal cavity			2					
Cancer and other malignant tumors of the stomach and liver							2	
Cancer and other malignant tumors of the female genital organs								
Cancer and other malignant tumors of the breast								
Cancer and other malignant tumors of the skin			2					
Cancer and other malignant tumors of other organs and of organs not specified	1		2				2	
Other tumors (tumors of the female genital organs excepted)	2	1	8					
Acute articular rheumatism	1		1					
Chronic rheumatism and gout								
Scurvy								

OF THE PANAMA CANAL FOR THE YEAR. 1919.—Continued.

Nonemployees.										Nonresidents.									
Discharges.					Deaths.					Discharges.				Deaths.				Total discharges.	Total deaths.
White.			Black.		White.			Black.		White.		Black.		White.		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
	1			1				2	3									2	5
				6				2	1									6	3
		2	1	1				1		1								5	3
1	2	1								1								5	
			1															1	
										1								1	
		1																1	
			3															3	
																		1	
			2															2	
				2				4	5									11	10
		1	2	1														4	
4	1			1						6								21	
6	2		5	5						11								36	
27	7	4	10	73				2	2	22		2	1					346	4
2	1	3	1	2														11	1
	1			4				1	1									8	2
5			1	4				1		4								19	1
4		2	3	11						7								28	1
36	12	1	16	3						53		3						280	
		1	1	1						1		1						9	
1																		1	
4			1							3		2						41	
			2	1														4	
55	1		9	1						33		1						199	
14				1						3								24	
																		2	
				1			1		1									1	4
		2		6					5				1					9	5
		1		3														4	
		1																3	
2		1				1			1	2								8	4
5		7	4	7					1	1								35	1
4	2	1	1	4						2								16	
		1								2								3	
	1																	1	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
General diseases.—Continued.								
Diabetes	1							
Glycosuria								
Leukemia								
Leukemia, lymphatic								
Hodgkin's disease			1					
Anemia, chlorosis								
Chlorosis								
Primary pernicious	1							
Secondary, cause not determined	1	1					1	
Other general diseases	2							
Purpura hemorrhagica								
Alcoholism (acute or chronic)	9							
Alcoholism, acute	12		2					
Alcoholism, chronic								
Alcoholic psychosis			1					
Drug habit								
Diseases of the nervous system and of the organs of special sense.								
Encephalitis	1							
Simple meningitis							2	
Cerebro-spinal fever			1				1	
Pneumococcus meningitis								
Locomotor ataxia	1		1					
Other diseases of the spinal cord							1	
Acute anterior polio-myelitis	1							
Cerebral hemorrhage, apoplexy			3				6	
Softening of the brain							3	
Paralysis without specified cause			4					
General paralysis of the insane	1							
Other forms of mental alienation	3	1	6				1	
Dementia precox	1		2					
Toxic psychosis			2					
Epilepsy			8	1				
Convulsions (nonpuerperal) (5 years and over)								
Convulsions of infants (under 5 years of age)								
Chorea								
Hysteria		1						
Neuralgia	3	1	15					
Neuritis	8	2	3	2				
Other diseases of the nervous system	6	4	5				1	

F THE PANAMA CANAL FOR THE YEAR, 1919.—Continued.

Nonemployees.										Nonresidents.									
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White.		Black.		Total discharges.	Total deaths
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
		1		2			2				2							6	3
1										1								2	
				2				1										2	1
							1							1					1
1																		2	
	1	1																12	
	1																	1	
																		1	
	1	6								1								10	1
5	5	13	2	2						2		2						33	
								1											1
4	2									1								16	
4	4									5								27	
1										1								2	
2			1															4	
												1						1	
																		1	
							1	3	1										7
					2					2								3	3
								2											2
	2	2																6	
1	2									1				1				4	2
																		1	
			1	1				2										5	8
								2											5
1	3		2	3				1		1								14	1
1								3								1		2	4
12	4	5	11	10		2		1	3	2	1							55	7
15	3	1	15	4				2	1	1		1						43	3
			1	2														5	
1	2	2	2	3					1	1								20	1
			1	1														2	
	1			2					2									3	2
				1														1	
5		5		4						2	2							19	
1		1		1						1								23	
9	1	1		3						5	1							35	
9	1	6	3	5						7								46	1

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the nervous system and of the organs of special sense.—Continued.								
Organic disease of the brain			2					
Tumor of the brain								
Neurasthenia	9	6	2	2				
Diseases of the eyes and their annexa	18		97	1				
Follicular conjunctivitis	4	1	4					
Trachoma			6					
Cornea	8		32	2				
Iris	2		14					
Lens			4					
Fundus	1							
Diseases of the ears	12		4					
Otitis, external	3	2	3					
Otitis media	4		5					
Diseases of the circulatory system.								
Pericarditis			1					
Malignant endocarditis							1	
Organic diseases of the heart	3		48	1	1		13	
Angina pectoris	1							
Diseases of the arteries, atheroma, aneurysms, etc.			1					
Aneurysm			8				2	
Arteriosclerosis	1		4					
Embolism and thrombosis							1	
Diseases of the veins, (varices, hemorrhoids, phlebitis, etc.)	2		10	1				
Hemorrhoids	23	1	27					
Varices	4		1	1				
Varicocele	8		21					
Phlebitis								
Diseases of the lymphatic system (lymphangitis, etc)	9	5	4					
Lymphadenitis (nonvenereal)	7		56	1				
Hemorrhage; other diseases of the circulatory system	2		2					
Diseases of the respiratory system.								
Diseases of the nasal fossæ	28	4	10		1			
Adenoid vegetations								
Myiasis of nasal fossæ and sinuses	2							
Diseases of the larynx			2					
Laryngitis			2					

OF THE PANAMA CANAL FOR THE YEAR, 1919.—Continued.

Nonemployees.									Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.				Discharges.				Deaths.					
White.			Black.		White.			Black.	White.		Black.		White.		Black.			
Soldiers.	Others.				Soldiers.	Others.												
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
			1	1	1												2	
																	2	
43	4	14		4					20	1							105	
23	3	6	17	30					6		3						204	
3			3	2					2								19	
2	1			2													11	
6		1	8	9					2								68	
1		1	3	1					1		1						24	
	1	1		1					2								9	
	1																2	
45	8	9	5	7					2		1						93	
23	3	4							3								41	
7	4	5	4	4				1	1								34	1
		1						1									2	1
																		1
5	8	4	4	15		3	3	1	4	4		1					93	26
		1															2	
	1																2	
	2			1				1					1				11	4
			1														6	
1				1				1			1						2	2
				2					1								16	
35	5	8	2	12					3								116	
4		2		1					3								16	
26	1	1	1						4								62	
2																	2	
7	3	5	1	6				1	3								43	1
40	2	4	6	11					7		2						136	
1		1							1	1							8	
48	9	14	6	6					7	1							133	1
	6	8	4	3													21	
				1					1								4	
1	1		1														5	
		2		1					1								6	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the respiratory system.—Continued.								
Diseases of the thyroid body								
Acute bronchitis	30	2	28	1				
Chronic bronchitis	6		4					
Broncho-pneumonia	1		3				3	
Pneumonia (unqualified)			1					
Lobar pneumonia	3		23		1		11	
Pleurisy	5		10					
Empyema								
Pulmonary congestion, pulmonary apoplexy								
Gangrene of the lungs			3					
Asthma	5	1	6					
Pulmonary emphysema								
Other diseases of the respiratory system (tuberculosis excepted)		2						
Abscess of lungs								
Diseases of the digestive system.								
Diseases of the mouth and annexa			4	2				
Diseases of the teeth and gums	5		6					
Stomatitis	2							
Diseases of the pharynx	2	1	3					
Pharyngitis		3	10					
Follicular tonsillitis	49	18	43	3				
Foreign body in the esophagus			1					
Stricture of the esophagus			1					
Ulcer of the stomach	2		1				1	
Other diseases of the stomach (cancer excepted)	5	2	1				1	
Acute gastritis	4		5					
Chronic gastritis	7		7					
Acute indigestion	1	3	6					
Diarrhea and enteritis (under two years)		1						
Colitis (under two years)	1		1					
Diarrhea and enteritis (two years and over)	13	5	10				1	
Colitis (two years and over)			2					
Ankylostomiasis	6		14					
Intestinal parasites			3					
Ascariasis			6					
Teniasis	1		1					
Strongyloidosis			1					
Appendicitis and typhlitis	1							
Acute appendicitis	12	3	8	1				

OF THE PANAMA CANAL FOR THE YEAR, 1919.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White.		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M	F.	M.	F.	M.	F.	M.	F.		
1		2		1														4	
18	30	43	18	21						14	1	1						207	
9	2	3		3						10								37	
1	2		3	7				6	2	1	1			2				19	13
2	1		2		2					1								7	3
3	1	1	10	5					2	2		1		2				49	17
10	2	2	2	6						4								41	
			1	1						1								3	
			1															1	
		2		2					1									7	2
4		6	3	4						7								36	
																			1
2		1		1														6	
1										2								3	
2		3		5						1								17	
12	2	11	2	7						2		1						48	
21	3	3	2	2														14	
6	2	3	1	8														26	
6	2	6	1	1							1							30	
72	10	124	48	87						16	6							367	
	1			4														2	
																		5	
1	1	3		1						1								10	1
2	3	5								1								19	1
6	1	2	2	3						3								26	
12	1		1	3						6								27	
6	6	3	4	9				1		5								43	1
	2	4	4	3				4	1		1							16	5
1		2	1					3		1								7	3
4	2	9	5	2						7	2	1						60	1
1	1	1								4								9	
5	5	3	3	2						1		2						41	
	1	1																5	
	2	2	2	1						3	2							18	1
										1	1							4	
																		1	
1		2		1							1							6	
49	15	15	1	2	2		1			11	2	1						120	3

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the digestive system.—Continued.								
Chronic appendicitis	10	2	5	1				
Hernia, intestinal obstructions							2	
Inguinal hernia	36		343				1	
Other hernias	2		10					
Intestinal obstruction							1	
Other diseases of the intestines	10	6	9	2				
Constipation	5		9	2				
Duodenal ulcer	6		3				1	
Cirrhosis of the liver			3				2	
Biliary calculi	1	4	1					
Other diseases of the liver	4		4					
Abscess of liver (unqualified)							2	
Abscess of the liver, entamebic	1		1				1	
Cholecystitis	5		8					
Diseases of the spleen								
Simple peritonitis (nonpuerperal)		2					2	
Other diseases of the digestive system (cancer and tuberculosis excepted)	3	1	4					
Nonvenereal diseases of the genito-urinary system and annexa.								
Acute nephritis			1				5	
Bright's disease (chronic nephritis)	8		15	2			12	
Other diseases of the kidney and annexa	5		3					
Bilharziasis of urinary tract								
Movable kidney								
Pyelo-nephrosis	3		3					
Calculi of the urinary passages	11	2	5					
Diseases of the bladder	3	1	1				1	
Cystitis	4	2	9					
Diseases of the urethra, urinary abscess, etc	3		15				1	
Stricture of the urethra, nonvenereal	2		28					
Vesico-vaginal fistula								
Acute prostatitis			1					
Chronic prostatitis			2				1	
Abscess of the prostate								
Hypertrophy of prostate	1							
Nonvenereal diseases of the male genital organs	13		42					
Hydrocele			110					
Lymph scrotum and varix	2							

OF THE PANAMA CANAL FOR THE YEAR, 1919.—Continued.

Nonemployees.										Nonresidents.									
Discharges.					Deaths.					Discharges.				Deaths.				Total discharges.	Total deaths.
White.			Black.		White.			Black.		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
30	6	18		7						11	3							93	
		1							1									1	3
15	8	1	12	2						20		4						441	1
	3	3	1	3						2	1							27	
2	2	1	1						2									6	3
20	7	14	2	15						8	1	1						95	
12	5	12		14						3		1						63	
3								1		2								14	2
	1	1	1						2									6	4
	1	3		1						2	4							17	
5		2	1	1						2								19	
1	1			1				1		1								4	3
1					1	2			1									3	5
3	1	3	1	2														23	
		2		1														3	
1		3		24				1	2									30	5
1	5	4		1						1								20	
1			1	2				2	5	1								6	12
10	6	5	1	14	1	1	1	4	2	6				1				67	22
4	1	6	1	7		1				1								28	1
												1						1	
		2		1														3	
2	3	17	2	6				2	1	1					1			37	4
2	3	2								3								28	
1		3	1															10	1
4	2	9		5						2								37	
6	1		1							3								29	1
2	1	1								2		1						37	
				2														2	
										1								2	
										3								5	1
	1																	1	
						1												1	1
16	4		11							4		1						91	
6	2		3							3		1						125	
										1									3

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
Nonvenereal diseases of the genito-urinary system and annexa.—Continued.								
Uterine hemorrhage (nonpuerperal)		2						
Uterine tumor (noncancerous)				1				
Other diseases of the uterus		5						
Metritis		1		1				
Cysts and other tumors of the ovary								
Salpingitis and other diseases of the female genital organs		4		3				
Nonpuerperal diseases of the breast (cancer excepted)			1					
Benign tumor of breast								
The puerperal state.								
Normal labor				1				
Accidents of pregnancy								
Extra-uterine pregnancy								
Hyperemesis gravidarum								
Abortion		1						
Puerperal hemorrhage								
Other accidents of labor								
Puerperal septicemia								
Puerperal albuminuria and convulsions								
Eclampsia								
Following childbirth (not otherwise defined)								
Puerperal diseases of the breast								
Diseases of the skin and of the cellular tissue.								
Gangrene								
Furuncle	8		3					
Carbuncle	5		2					
Acute abscess	14		48	1			1	
Phlegmon and cellulitis	16		40	2				
Trichophytosis			1					
Scabies	1		3					
Chiggers (Pulex penetrans)	1							
Ground itch								
Elephantiasis			1					
Dhobie itch	3		3					
Ulcer of the skin	4		58	1				
Tropical ulcer								
Ulcerating granuloma of the pudenda								

OF THE PANAMA CANAL FOR THE YEAR, 1919.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White			Black.		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
		2		4							1							9	
		8		54														63	
		42		91							5							143	
		10		19							2							33	
		7		14														21	
		30		104					1		1							144	1
1		3		8														13	
		3		2														5	
		221		118							1							341	
		12		26														38	
		1		8														9	
		10		16														26	
		53		27							2							84	
		3		3					1									6	1
		22		11							2				1			35	1
		3		1														4	
		3		1					1									4	1
		1		3					4									4	4
		1																1	
		1		1														2	
1			1	2						1								5	
4	4	1		2						3		1						26	
1	1	3		2								1						16	
13	8	13	13	22						11		3		1				147	2
12	1	10	7	3				1		10		2						105	1
3	1	1																6	
2										2								8	
																		1	
1																		1	
				1														2	
7	1			3						3	1							21	
3	4	2	11	9						4		2						98	
				4														4	
				1														1	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPIT

Diseases	Employees.							
	Discharges.				Deaths.			
	White.		Black		White.		Blac	
	M.	F.	M.	F.	M.	F.	M.	
Diseases of the skin and of the cellular tissue—Continued.								
Impetigo contagiosa								
Urticaria	2	1						
Ingrowing nail	4	3	3					
Other diseases of the skin and annexa	21	5	26	1				
Diseases of the bones and of the organs of locomotion.								
Diseases of the bones (tuberculosis excepted)	1		3					
Mastoid abscess	1	1	2					
Osteomyelitis	1		1					
Periostitis			2					
Diseases of the joints (tuberculosis and rheumatism excepted)	1		5					
Ankylosis			2					
Arthritis	6		33	2			1	
Synovitis	3		4					
Amputations	1		6					
Other diseases of the organs of locomotion	15	7	17					
Malformations.								
Congenital malformations (stillbirth not included)	2		31					
Diseases of early infancy.								
Newborn child								
Congenital debility, icterus, and sclerema								
Premature birth								
Atrophy of infants								
Malnutrition								
Other causes peculiar to early infancy (including various consequences of labor)								
Old age.								
Senility	1		1					
Senile dementia								

OF THE PANAMA CANAL FOR THE YEAR, 1919.—Continued.

Nonemployees.										Nonresidents.									
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White			Black		White.		Black.		White		Black.		Total discharges.	Total deaths
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
	5	4	6	2						3	1							21	
2		3		2														10	
8	1	7									1							27	
13	5	17	2	5						10		1						106	
5	2	3		1						1								16	
3	2	1	1	2						2								14	
		1																3	
5				1						1								9	
3	1	1	1	3														15	
2			1															3	
6	2	7	5	9						8		2						50	1
	1																	8	
1																		8	
15	2	6		3						7	1	2						75	
7	25	2	28	2		1		3	2	5								102	6
	110	130	58	46		1		1	1									344	3
		1							1									1	1
	3	2	2			1	1	2	4									7	8
		1						1										1	1
	1		12	6		2		19	10									19	31
			1	1			1	1										2	2
	1			1														4	
	1																	1	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
Affections produced by external causes.								
Suicide by firearms							1	
Other suicides			1					
Poisoning by food	7							
Other acute poisonings	1		1					
Venomous bites and stings	1							
Conflagration			1					
Burns (conflagration excepted)	7		17				1	
Absorption of deleterious gases (conflagration excepted)	1							
Accidental drowning								
Traumatism by firearms	1		4	1				
Traumatism by cutting or piercing instruments	7		111	1			1	
Traumatism by fall	26	7	124	1			2	
Traumatism by machines	5	1	14				1	
Traumatism by other crushings	16		44					
Railroad traumatism	2		10					
Dynamite traumatism	1		2					
Injuries by animals	1		5					
Starvation							1	
Effects of heat								
Heat exhaustion								
Homicide by firearms							1	
Homicide by cutting or piercing instruments	1		2				4	
Fractures (cause not specified)	4		10	1				
Dislocations	2		2					
Sprains	7		10					
Other external violence	28	2	327				1	
Legal execution			1					
Ill-defined diseases.								
Ill-defined organic disease	3							
Sudden death			1					
Cause of death not specified or ill-defined	4				1		2	
Infections of undetermined origin	7		17	2				
No disease	13	1	37	5				
Feigned disease			2					
Total	1106	155	3543	126	5		128	

OF THE PANAMA CANAL FOR THE YEAR, 1919.—Continued.

Nonemployees,										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
						1													2
																		1	
1	1	1		1														11	
1	3	2	2	1					1									11	1
1		1	1															4	
										1								2	
4	2	1	2	3			1	2		9		4		1				49	5
																		1	
1				1						1								3	
16	3	1	4		1					3								33	1
9	9		8	8		1				6								159	2
24	16	10	28	8				2	4	28	1			1				273	9
2	1	1	2	1						7								34	1
17	4	1	7	4				2		3		1						97	2
			3					1		1								16	1
																		3	
5				1						1								13	
																			1
										1				1				1	1
										1								1	
														1					2
																		3	4
19	3		2	6				1		2								47	1
2	2		1	2						1	1							13	
6	1	1								9								34	
36	9	3	23	7				1		19	1	3	1					459	2
																		1	
2	1	2	3	3				1	2									14	3
																		1	
1		1	2					3	3					1				8	10
13	6	12	4	12		2		2	2	8	1	1			1			83	7
33	27	111	26	82						20	14	1						370	
		1									7							10	
1657	785	1488	719	1595	11	23	17	116	132	778	89	79	4	21	3	3	12	124	459

TABLE XI.—CONSOLIDATED HOSPITAL REPORT.
[A.=White Americans; F.=White foreigners; B.=Black.]

	Remaining January 1, 1919.			Admitted.			Died.			Discharged.		
	A.	F.	B.	A.	F.	B.	A.	F.	B.	A.	F.	B.
Ancon Hospital:												
Employees	23	9	225	813	201	3,187	5	1	109	803	191	3,093
Soldiers	103			1,374			8			1,433		
Panama pay patients						6						
Other pay patients	41	36	50	1,446	915	1,836	16	26	150	1,418	863	1,645
Charity patients	12	2	14	233	72	497	2	4	22	232	61	334
Total	179	47	289	3,866	1,188	5,436	31	31	281	3,886	1,115	5,071
Corozal Hospital (insane):												
Employees	1	2	14	3	1	17				3	1	16
Soldiers	9			18						27		
Panama pay patients	3	59	222		20	41		6	23		14	29
Other pay patients		3	2	3	1	24			4	1		6
Charity patients		13	70	3	3	17		1	9	2	5	14
Total	13	77	308	27	25	99		7	36	33	20	66
Grand total	192	124	597	3,893	1,213	5,535	31	38	317	3,919	1,135	5,136
Corozal Farm (cripples):												
Employees		7	44		6	11					4	13
Chronic ward:												
Charity patients			26			8						3
Colon Hospital:												
Employees	1	3	10	264	45	750			18	224	35	548
Soldiers	7	1		203	38		3			160	29	
Panama pay patients		1	2	3	12	63		3	7		3	16
Other pay patients	9	8	14	367	262	427	1	5	30	305	168	282
Charity patients	4		1	71	9	64	1		3	66	8	44
Total	21	13	27	908	366	1,304	5	8	58	755	243	889
Palo Seco Leper Asylum:												
Panama pay patients		2	43		2	5			1		1	6
Charity patients			31		1	6						5
Total		2	74		3	11			1		1	11
Grand total:												
Employees	25	21	293	1,080	253	3,965	5	1	127	1,030	231	3,699
Soldiers	119	1		1,595	38		11			1,620	29	
Panama pay patients	3	62	267	3	34	115		9	31		18	51
Other pay patients	50	47	66	1,816	1,178	2,287	17	31	184	1,724	1,081	1,932
Charity patients	16	15	142	307	85	502	3	5	34	300	74	389
Total	213	146	768	4,801	1,588	6,869	36	46	376	4,674	1,383	6,051

TABLE XI.—CONSOLIDATED HOSPITAL REPORT.—Continued.
[A. = White Americans; F. = White foreigners; B. = Black.]

	Transferred.			Remaining December 31, 1919.			Average number constantly in hospital			
	A	F.	B	A.	F.	B.	A.	F.	B.	Total.
Ancon Hospital:										
Employees	4	3	52	24	15	159	25.49	9 80	168 19	203 48
Soldiers	16	...	...	20	...	...	58.12	...	...	58.12
Panama pay patients	...	...	5	...	...	1	...	...	21	21
Other pay patients	4	...	35	49	62	56	41.08	33.08	70 27	144.43
Charity patients	1	3	50	10	6	15	9 70	3.52	18 39	31 61
Total	25	6	142	103	83	231	134.39	46.40	257.06	437.85
Corozal Hospital (insane):										
Employees	...	...	...	1	2	15	1.09	1.47	18.00	20 56
Soldiers	...	...	...	...	...	...	2.72	...	...	2.72
Panama pay patients	...	...	2	3	59	209	3.00	55 22	215 28	273.50
Other pay patients	...	...	...	2	4	16	.17	3.61	11.36	15 14
Charity patients	...	1	1	1	9	63	.69	10.20	69.75	80.64
Total	...	1	3	7	74	303	76.7	70.50	314.39	392 56
Grand total	25	7	145	110	157	534	142.06	116.90	571.45	830.41
Corozal Farm (cripples):										
Employees	...	...	...	...	9	42	...	8 97	46.72	55 69
Chronic ward:										
Charity patients	...	...	6	...	...	26	...	...	26.57	26.57
Colon Hospital:										
Employees	39	13	180	2	...	14	4 41	1 33	19 60	25.34
Soldiers	47	10	...	...	...	...	4 53	.95	....	5.48
Panama pay patients	3	7	42	...	...	...	01	.32	.84	1.17
Other pay patients	58	92	123	12	5	7	7.99	5.11	9.09	22.19
Charity patients	6	1	18	2	...	...	2.06	.22	.69	2 97
Total	153	123	363	16	5	21	19.00	7.93	30 22	57 15
Palo Seco Leper Asylum:										
Panama pay cases	...	...	...	...	3	41	...	2.03	41 69	43.72
Charity patients	...	...	...	...	1	32	...	.19	31.42	31 61
Total	...	...	...	...	4	73	...	2 22	73.11	75 33
Grand total:										
Employees	43	16	232	27	26	230	30 95	21.56	252 51	305.06
Soldiers	63	10	...	20	...	...	65.38	.95	.....	66.33
Panama pay patients	3	7	40	3	62	251	3.01	57.57	258.02	318 60
Other pay patients	62	92	158	63	71	79	49.23	41.79	90 81	181.83
Charity patients	7	5	75	13	16	136	12.45	14 13	146.82	173.40
Total	178	130	514	126	175	696	161 06	126 00	748.16	1,045.22

TABLE XII.—CONSOLIDATED DISPENSARY REPORT.

EMPLOYEES TREATED IN QUARTERS.

	Remaining Jan. 1, 1919.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31, 1919.		Days lost.		
	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	Total
Ancon	8	...	1,360	1,328	...	...	1,342	1,256	23	65	3	7	3,061	4,466	7,527
Balboa	2	6	2,021	53	...	...	2,017	53	3	6	3	....	4,771	268	5,039
Pedro Miguel	...	...	171	185	...	...	165	181	5	3	1	1	485	450	935
Gatun	...	...	150	178	...	...	134	160	16	18	...	....	453	1,346	1,799
Cristobal	7	43	893	2,026	...	...	856	2,003	9	38	5	26	2,781	17,441	20,222
Total	17	49	4,595	3,770	...	...	4,544	3,653	56	130	12	34	11,551	23,971	35,522

ALL CASES TREATED BUT NOT EXCUSED.

	Employees.			Nonemployees.			Total.		
	W.	B.	Total.	W.	B.	Total.	W.	B.	Total.
Ancon	11,206	57,937	69,143	12,392	20,499	32,891	23,598	78,436	102,034
Balboa	51,649	34,125	85,774	29,949	12,940	42,889	81,598	47,065	128,663
Pedro Miguel	17,486	27,831	45,317	18,441	20,946	39,387	35,927	48,777	84,704
Gatun	4,327	16,185	20,512	5,740	7,986	13,726	10,067	24,171	34,238
Cristobal	9,464	55,518	64,982	9,343	17,225	26,568	18,807	72,743	91,550
Total	94,132	191,596	285,728	75,865	79,596	155,461	169,997	271,192	441,189

TABLE XIII.—CONSOLIDATED ADMISSION REPORT.

	White.	Black.	Total.
Admissions to hospitals, excluding Corozal farm and chronic ward	6,385	6,878	13,263
Admissions of employees to quarters	4,595	3,770	8,365
Total admissions to hospitals and quarters	10,980	10,648	21,628
Less number of patients transferred between hospitals and from quarters to hospitals, whose admissions are duplicated in the above figures	369	642	1,011
Net admissions to hospitals and quarters	10,611	10,006	20,617
EMPLOYEES.			
Employees admitted to hospitals	1,330	3,983	5,313
Employees admitted to quarters	4,595	3,770	8,365
Total admissions of employees	5,925	7,753	13,678
Less number transferred between hospitals and from quarters to hospitals, whose admissions are duplicated in the above figures	115	359	474
Net admissions of employees	5,810	7,394	13,204
Annual admission rate per thousand employees to hospitals and quarters	1,285.72	377.76	550.21

TABLE XIV.—NUMBER OF EMPLOYEES CONSTANTLY SICK IN HOSPITALS AND QUARTERS.

	White.	Black.	Total.
Hospitals:			
Ancon Hospital	37.85	186.04	223.89
Colon Hospital	5.66	19.60	25.26
Total	43.51	205.64	249.15
Quarters:			
Ancon	8.51	12.40	20.91
Balboa	13.25	.74	13.99
Pedro Miguel	1.35	1.25	2.60
Gatun	1.26	3.74	5.00
Colon	7.72	48.45	56.17
Total	32.09	66.58	98.67

TABLE XV.—AVERAGE NUMBER OF DAYS IN HOSPITAL OR QUARTERS FOR EACH ADMISSION OF SICK EMPLOYEE.

	White.	Black.	Total.
Hospitals:			
Ancon Hospital	12.84	18.82	17.40
Colon Hospital	8.02	9.05	8.26
Total (average)	11.27	15.98	15.62
Quarters:			
Ancon	2.32	3.79	2.91
Balboa	2.33	5.28	2.40
Pedro Miguel	2.84	2.94	2.83
Gatun	2.97	6.87	5.14
Colon	3.05	8.92	7.10
Total (average)	2.51	6.83	4.43

TABLE XVI.—NUMBER OF DAYS HOSPITAL TREATMENT FURNISHED VARIOUS CLASSES OF PATIENTS.

Class.	American.	Foreign.	Black.	Total.
Ancon Hospital:				
Panama Canal employees	9,207	3,590	61,293	74,090
Army and Navy patients	21,209			21,209
Panama Government pay patients			38	38
Other pay patients	14,987	12,104	25,718	52,809
Charity patients	3,523	1,288	6,688	11,499
Total	48,926	16,972	93,737	159,635
Corozal Hospital (insane):				
Panama Canal employees	397	537	6,528	7,462
Army and Navy patients	1,008			1,008
Panama Government pay patients	1,095	20,179	78,558	99,832
Other pay patients	61	1,318	4,073	5,452
Charity patients	249	3,783	25,469	29,501
Total	2,810	25,817	114,628	143,255
Chronic ward:				
Charity patients			9,700	9,700
Colon Hospital:				
Panama Canal employees	1,611	455	7,099	9,165
Army and Navy patients	1,647	346		1,993
Panama Government pay patients	4	119	310	433
Other pay patients	2,818	1,864	3,315	7,997
Charity patients	754	82	249	1,085
Total	6,834	2,866	10,973	20,673
Palo Seco Leper Asylum (lepers):				
Panama Government pay patients		865	14,955	15,820
Charity patients		90	11,364	11,454
Total		955	26,319	27,274

TABLE XVII.—WARD LABORATORY REPORTS.

	Ancon Hospital.	Colon Hospital.	Santo Tomas Hospital.
Blood examinations (total number)	6,715	1,140	1,867
Estivo-autumnal	572	196	293
Tertian	299	28	171
Mixed, tertian, and estivo-autumnal	1		
Quartan	18	1	
Filaria	4		
Spirillum of relapsing fever	1		
White blood counts	1,261	208	58
Red blood counts	384	17	30
Differential counts	798	43	23
Hemoglobin estimations	4,066	37	43
Stool examinations (total number)	7,645	128	6,149
Ameba coli	108	1	38
Entameba histolytica	18	2	29
Uncinaria	765	8	1,354
Ascaris	241	4	491
Tricocephalus dispar	526	7	294
Bilharzia	1	1	
Tinea saginata	11		2
Strongyloides	297	12	263
Trichuris	12	2	
Ciliated monads (includes cercomonas hominis and trichomanas vaginalis)	132	6	26
Balantidum coli			2
Pus cells	49	5	23
Blood corpuscles	5	5	15
Pus and blood	214	2	22
Pus, blood, and mucus	44	2	26
Guaiac test for occult blood	153	5	
Urine examinations (total number)	21,684	2,782	5,350
Acetone	42	11	2
Diacetic acid	37		
Albumen	5,148	491	1,263
Sugar	3,214	11	68
Bile	111	3	11
Guaiac test for occult blood	180	2	
Sediment	1,709	48	
Epithelial cells	5,723	70	102
Cylindroids	372	6	52
Hyaline casts	1,853	229	458
Granular casts	1,539	163	146
Pus casts	144	227	15
Pus cells	2,252	370	179
Red blood corpuscles	251	62	41
Pus and blood	6,048	100	32
Gonococci	61	2	
Indican	127		
Mucus and pus	182	25	
Phosphates	27	7	
Urates	12		
Hemin crystals	11		
Functional kidney tests	63		
Sputum (total examinations)	4,990	173	927
Tubercle bacilli	340	23	319
Pneumococci	4	1	2
Streptococci		3	
Spinal fluid	201	2	3
Smears of sediment	13	2	12
Pneumococcus	1		
Meningococcus		1	
Streptococcus			1
Other organisms			1
Cell count	95	2	1

TABLE XVII.—WARD LABORATORY REPORTS.—Continued.

	Ancon Hospital.	Colon Hospital.	Santo Tomas Hospital.
Smear examinations (total number)	1,201	54	6,344
Urethral	611	27	221
Vaginal	206	2	2,823
Eyes	31	2	24
Nasal	3	.....	42
Throat	83	5	181
Others	10	8	38
Spinal fluid	185	.....	.....
Widal reactions	15	.....	28
Wassermann reactions	.....	.....	1,868

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.
	Number.	Died.	Number.	Died.	Number.
Amputations:					
Arm					2
Forearm			1		
Hand			3		5
Shoulder					1
Foot	1				3
Thigh	6	1	2	2	2
Leg	1		3		6
Resection of ankle					1
Digits, single	8				
Digits, multiple	11		4		19
Operations on bones:					
Laminectomy					2
Craniectomy, decompressive	3	1	5	3	1
Osteotomy	2		3		1
Resection of knee					1
Resection of hip	1		2		
Excision of maxilla	1				
Wiring of fractures, simple	10		1		
Plating of fractures, simple	3				
Wiring of fractures, compound	2		2		
Nailing of fractures, simple	2				
Resection of elbow	3				
Lane plate, femur			2		
Lane plate, humerus			2		
Lane plate, tibia	2		1		
Lane plate, ulna			1		
Lane plate, radius	1				
Bunion excision, double	1		1		
Adenectomy:					
Cervical	10				9
Inguinal, single	189		35		107
Inguinal, double	34		5		51
Femoral	14				2
Herniotomy:					
Inguinal, single	178	1	39		110
Inguinal, double	32		37		15
Ventral	20		8		12
Combined			1		1
Strangulated	5	2	4		7
Femoral	1		2		2
Diaphragmatic	1				
Reduction of fractures	8				
Genito-urinary tract:					
Nephropexy	2				
Cystotomy	2		2		4
Prostatectomy	2				1
Urethrotomy, internal	9				53
Urethrotomy, external	11	1	2		38
Varicocele, radical cure	24		22		4
Hydrocele, single, radical cure	58		74		28
Hydrocele, double, radical cure	6		2		3
Orchidectomy	6		6		11
Cystotomy, suprapubic					2
Epididymotomy	43		1		3
Vasectomy	2				
Amputation of scrotum	23				3

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.—Continued.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital
	Number.	Died.	Number.	Died.	Number
Genito-urinary tract—Continued:					
Amputation of penis	1				2
Curettage uteri	235		11		97
Perineoplasty	21		2		5
Nephrectomy	1				
Nephrotomy	2		1		
Trachelorrhaphy	8		4		6
Vaginal punctures	4				1
Vaginal section					4
Epididymotomy	4				
Circumcision	149				173
Obstetrical:					
Cesarian section, abdominal	6	1	2	2	
High forceps	1		2		
Low forceps	8		6		
Accouchement forceps			3		
Version	4		5		
Perineorrhaphy	18				8
Abdominal pregnancy	1				
Thorax:					
Excision of breast	4		3		2
Thoracotomy	3				3
Rectum:					
Hemorrhoids, radical cure	123		11		75
Fistula in ano, excision of	3		6		21
Prolapsus rectum, radical cure	2		3		
General:					
Thyroidectomy	7		1		6
Varicose veins, excision of	20		11		5
Tenorrhaphy			1		
Myorrhaphy	1				
Excision of surface neoplasms	11		7		
Stab wounds of soft parts, operation for	1		7	3	
Gunshot wounds of soft parts, operation for	1		3		7
Extensive injuries to soft parts, operations for	5	1	1		
Plastic operations for severe injuries	3				1
Plastic operations for congenital defects	5		16	1	
Nerve stretching	2				
Skin graft	5		2		23
Plastic tattoo					1
Laparotomy:					
For general peritonitis (not traumatic or appendiceal)			2	1	
For tuberculous peritonitis	2		2	1	
For intestinal obstruction	3	1	1	1	2
Exploratory	14	1	4		19
Gastro-enterostomy	3		3		8
Entero-enterostomy	1				
Enterectomy	2		1		
Appendectomy	158		75	1	129
Appendectomy with local peritonitis	18	1	13		3
Appendectomy with general peritonitis	8	1	9	1	2
Colostomy	1	1			
Cholecystotomy	11		2		5
Cholecystostomy	2		1		
Cholecystectomy	6		4		11
Choledochotomy	1				

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.—Continued.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.
	Number.	Died.	Number.	Died.	Number.
Laparotomy—Continued:					
Abscess of liver, laparo-hepatotomy	6	1	3	1	4
Abscess of liver, thoraco-hepatotomy	4	1	1	.....	5
Pan-hysterostomy	3	.....	2	.....	68
Splenectomy	2	2	.....	.....	2
Supravaginal hysterectomy	51	1	25	.....	100
Hysteromyomectomy	33	.....	5	1	20
Myomectomy	1	.....	.....	.....	.....
Salpingectomy	9	.....	8	.....	71
Salpingectomy, double	4	.....	16	.....	101
Salpingo-oophorectomy	33	1	.....	2	168
Ovarian cystectomy	10	.....	8	.....	1
Oophorectomy	3	.....	4	.....	68
Suspensio-uteri	83	.....	27	.....	67
Ectopic gestation	8	.....	4	.....	1
General peritonitis	3	1	2	1	.....
Rupture of spleen	.....	.....	.....	.....	1
Rupture of liver	1	.....	.....	.....	.....
Gunshot wound of abdomen	.....	.....	1	1	.....
Stab wound of abdomen	.....	.....	2	2	.....
Major operations, various	23	.....	5	.....	246
Minor operations, various	2,154	.....	66	.....	909

TABLE XIX.—REPORT OF OPERATIONS, EYE AND EAR DEPARTMENTS.

ANCON HOSPITAL.

Eye:	
Advancement	1
Cataract extraction	14
Simple	2
Combined	2
Chalasion, removal	20
Enucleation	5
Evisceration	1
Foreign body, removal	1
Iridectomy	2
Lid operation:	
Expression of lids	1
Plastic	4
Needling	16
Pterygium	28
Refractions	1,050
Tenotomy	2
Ear:	
Furuncle, incision	5
Foreign body, removal	9
Mastoid operation:	
Simple	10
Radical	7
Paracentesis	19
Plastic	1
Polypi, removal	3
Others	2
Nose.	
Cauterization	9
Foreign body, removal	1
Plastic	3
Polypi, removal	14
Rhinoplasty	9
Sinuses:	
Ethmoid, simple	11
Ethmoid, radical	3
Frontal, simple	8
Frontal, radical	3
Maxillary, puncture and irrigation	8
Maxillary drainage	1
Spur removal	1
Submucous resection	61
Turbinectomy	22
Pharynx:	
Adenoidectomy	253
Cauterizations	7
Peritonsillar abscess incision	26
Tonsillectomy	427
Larynx:	
Abscess, incision	1
Tumors, removal	1

SANTO TOMAS HOSPITAL.

Eye:	
Cataract extraction	55
Simple	30
Combined	9
Chalasion, removal	17
Conjunctival flap	1
Enucleation	6
Foreign body, removal	42
Hordeolum, incision	37
Iridectomy	45
Lachrymal operations:	
Dilatation of ducts	15
Dissection of sac	2

SANTO TOMAS HOSPITAL—Continued.

Eye—Continued:	
Lid operations:	
Ectropion	5
Entropion	6
Expression of lids	3
Pterygium	32
Refractions	61
Examinations	25
Ear:	
Furuncle, incision	19
Foreign body, removal	29
Mastoid operation:	
Simple	11
Radical	1
Ossiculectomy	1
Paracentesis	1
Polypi, removal	11
Perforation of drum	41
Curettage, ear	1
Nose:	
Cauterization	3
Foreign body, removal	18
Polypi, removal	3
Rhinoplasty	47
Sinuses, number	129
Ethmoid, simple	2
Maxillary, puncture and irrigation	1
Maxillary, drainage	1
Submucous resection	6
Turbinectomy	19
Deflected septum	33
Screw worm infection	3
Pharynx:	
Adenoidectomy	23
Cauterizations	13
Peritonsillar abscess incision	22
Tonsillectomy	166
Uvulectomy	27
Larynx:	
Foreign body, removal	6
Laryngoscopy	48
Trachea:	
Tracheotomy	1

TABLE XX.—REPORT OF X-RAY DEPARTMENT, ANCON HOSPITAL.

Nature of examinations:	
Arm	85
Arm and forearm	60
Chest	347
Dental	339
Elbow	86
Foot and ankle	350
Foreign body	40
Gall bladder	44
Hand	102
Head	71
Hip	50
Jaw	56
Kidney	115
Knee	91
Leg	72
Liver	4
Pelvis	20
Ribs	31
Shoulder	91
Sinuses	118
Spine	62
Stomach	241
Thigh	44
Treatment	101
Wrist	120
Total number of cases treated	2,794

CLASSIFICATION OF PLATES USED.

6½ x 8½	1,102
8 x 10	2,139
10 x 12	2,406
14 x 17	1,076
Dental films	1,056
Total	7,778

TABLE XXI.—SANTO TOMAS HOSPITAL.

PATIENTS TREATED.

Class.	Remaining Jan. 1, 1919.	Admitted.	Died.	Discharged.	Remaining Dec. 31, 1919.
Pay cases	29	870	39	845	15
Charity cases	473	8,288	756	7,608	397
Total	502	9,158	795	8,453	412

Class.	Number treated.	American.		Other nations.	
		White.	Black.	White.	Black.
Pay cases	899	9	.....	338	552
Charity cases	8,761	17	.....	1,027	7,717
Total	9,660	26	.....	1,365	8,269

Number of days relief furnished patients	158,587
Average number of patients constantly sick	434
Average number of days treatment for each patient admitted	10
Cost of subsistence per patient, per day	$0 344

DISPENSARY REPORT.

Class.	White.	Black.	Total.
Natives treated	101	12,719	12,820
Foreigners treated	405	5,135	5,540
Total	506	17,854	18,360

LIST OF DISEASES TREATED DURING THE YEAR 1919.

Typhoid fever	5
Malaria	644
Smallpox	3
Measles	116
Whooping cough	12
Diphtheria and croup	57
Influenza	118
Dysentery	53
Leprosy	4
Erysipelas	9
Chicken pox	13
Yaws	1
Purulent infection and septicemia	85
Glanders	2
Anthrax	3
Tetanus	3
Pellagra	1
Beriberi	11
Tuberculosis of the lungs	83
Acute miliary tuberculosis	1
Tuberculous meningitis	1
Pott's disease	2
White swellings	
Tuberculosis of other organs	

List of Diseases Treated During the Year 1919—Continued:

Rickets	27
Syphilis, primary	377
Gonococcus infection	41
Gonorrhea	813
Soft chancre	21
Adenitis chancroidal	5
Cancer and other malignant tumors of the buccal cavity	8
Cancer and other malignant tumors of the stomach and liver	5
Cancer and other malignant tumors of the peritoneum, intestines, rectum	4
Cancer and other malignant tumors of the female genital organs	13
Cancer and other malignant tumors of the breast	3
Cancer and other malignant tumors of the skin	4
Cancer and other malignant tumors of other organs and of organs not specified	15
Other tumors (tumors of the female genital organs excepted)	41
Acute articular rheumatism	26
Scurvy	1
Diabetes	4
Leukemia	1
Leukemia lymphatic	1
Anemia, chlorosis	22
Other general diseases	22
Alcoholism (acute or chronic)	55
Alcoholism, acute	3
Other chronic poisonings	1
Simple meningitis	3
Pneumococcus meningitis	1
Locomotor ataxia	3
Other diseases of the spinal cord	5
Acute anterior polio-myelitis	1
Cerebral hemorrhage, apoplexy	4
Paralysis without specified cause	15
Other forms of mental alienation	10
Maniac depresive psychosis	1
Toxic psychosis	2
Epilepsy	25
Convulsions (nonpuerperal, 5 years and over)	3
Hysteria	12
Neuralgia	31
Neuritis	3
Other diseases of the nervous system	20
Organic disease of the brain	2
Diseases of the eyes and their annexa	112
Follicular conjunctivitis	2
Trachoma	1
Diseases of the cornea	9
Diseases of the iris	1
Diseases of the lens	6
Diseases of the ears	7
Otitis media	3
Pericarditis	2
Organic disease of the heart	60
Angina Pectoris	1
Disease of the arteries, atheroma, aneurysm, etc.	67
Arteriosclerosis	5
Embolism and thrombosis	1
Diseases of the veins (varices, hemorrhoids, phlebitis, etc.)	57
Hemorrhoids	5
Varicocele	1
Disease of the lymphatic system (lymphangitis, etc.)	170
Hemorrhage; other diseases of the circulatory system	7
Diseases of the nasal fossae	17
Disease of the larynx	3
Diseases of the thyroid body	6
Acute bronchitis	5
Chronic bronchitis	70
Broncho-pneumonia	27
Pneumonia (unqualified)	30
Lobar pneumonia	

LIST OF DISEASES TREATED DURING THE YEAR 1919—Continued:

r	33
ma	4
ary congestion, pulmonary apoplexy	1
	17
isease of the respiratory system (tuberculosis excepted)	4
of the mouth and annexa	9
of the teeth and gums	2
s of the pharynx	232
gitis	1
ar tonsillitis	8
f the stomach	5
isease of the stomach (cancer excepted)	22
astritis	2
gastritis	3
digestion	3
a and enteritis (under 2 years)	25
(under 2 years)	6
a and enteritis (2 years and over)	66
2 years and over)	1
ltomiasis	225
al parasites	101
sis	17
asis intestinal	3
loidosis	3
icitis and typhlitis	76
ppendicitis	10
intestinal obstructions	146
l hernia	15
ernias	5
al obstruction	1
iseases of the intestines	13
ation	35
al ulcer	33
s of the liver	16
calculi	3
liseases of the liver	30
of liver (unqualified)	2
stitis	3
of the spleen	12
peritonitis (nonpuerperal)	6
ephritis	7
disease (chronic nephritis)	135
iseases of the kidney and annexa	1
ephrosis	1
of the bladder	24
	6
of the urethra, urinary abscess, etc	72
e of the urethra, nonvenereal	27
aginal fistula	1
s of the prostate	4
prostatitis	1
ereal diseases of the male genital organs	71
cele	1
ele	6
hemorrhage (nonpuerperal)	6
tumor (noncancerous)	41
iseases of the uterus	139
	30
nd other tumors of the ovary	15
tis and other diseases of the female genital organs	177
rperal diseases of the breast (cancer excepted)	5
labor	810
ts of pregnancy	212
n	11
al hemorrhage	1
ocidents of labor	13

List of Diseases Treated During the Year 1919—Continued:

Puerperal septicemia	3
Eclampsia	1
Gangrene	4
Furuncle	4
Acute abscess	125
Phlegmon and cellulitis	3
Scabies	33
Chiggers (Pulex penetrans)	1
Ulcer of the skin	32
Impetigo contagiosa	1
Other diseases of the skin and annexa	250
Diseases of the bones (tuberculosis excepted)	15
Osteomyelitis	4
Periostitis	3
Diseases of the joints (tuberculosis and rheumatism excepted)	24
Ankylosis	2
Arthritis	4
Amputations	3
Other diseases of the organs of locomotion	8
Congenital malformations (stillbirth not included)	76
Newborn child	817
Congenital debility, icterus and sclerema	1
Other causes peculiar to early infancy (including various consequences of labor)	2
Lack of care	2
Senility	6
Suicides	1
Poisoning by food	4
Other acute poisonings	5
Snake bites	1
Burns (conflagration excepted)	27
Traumatism by firearms	17
Traumatism by cutting or piercing instruments	78
Traumatism by crushings (vehicles, railroads, landslides, etc.)	11
Injuries by animals	1
Fractures (cause not specified)	71
Dislocations	9
Sprains	12
Other external violence	73
No disease	116
Other epidemic diseases	33
Total	8,447

TABLE XXII.—COROZAL HOSPITAL—STATEMENT OF COMMITMENTS, AND DISCHARGES.

COMMITMENTS.

	Male.	Female.
From Canal Zone:		
First admission	67	19
Second admission	5	
From Panama Government:		
First admission	37	16
Second admission	5	2
Totals	114	37

DISCHARGES.

	Well.		Improved.		Unimproved.	
	Male.	Female.	Male.	Female.	Male.	Female.
Antigua	1					
Barbados	3	2	2	2	3	
China	1		1			
Chile			1			
Colombia	1		3	1		1
Corsica					1	
Grenada	2				1	
Guadeloupe		1				
India			1			
Jamaica	5	1	7	4	2	
Martinique	2		5	1		
Mexico				1		
Nicaragua			1	1		
Panama	1		6	5	6	2
Porto Rico	1		1		1	
Spain	2					
St. Lucia	1					
St. Vincent	1					
Trinidad		1	1			
Turk's Island	1					
United States	2		21	1	7	1
Venezuela			1			
Totals	24	5	51	16	21	4

DEATHS.

Medical diagnosis.	Mental diagnosis.	Male.	Female.
Ascariasis	Toxic psychosis		1
Broncho-pneumonia	General paralysis of the insane	1	
Cerebral hemorrhage	Organic brain disease	1	
Cerebral syphilis	Cerebral syphilis	1	
Chronic diffuse nephritis	Syphilis		1
Chronic interstitial nephritis, organic brain disease	Senile dementia	1	
Disseminated tuberculosis	Dementia precox	1	
Disseminated tuberculosis	Infection exhaustion psychosis	1	
Disseminated tuberculosis	Psychosis with arteriosclerosis		2
Epilepsy	Epilepsy	1	
Epilepsy	Psychosis with epilepsy	1	
Gangrene of the lungs	Epilepsy		1
General paralysis of the insane	Arteriosclerosis with cerebral syphilis	1	
General paralysis of the insane	General paralysis of the insane	3	
Infection psychosis, exhaustive	Infection exhaustive psychosis with pellagra		1
Lobar pneumonia	Dementia precox	1	
Organic heart disease	Dementia precox	2	
Pellagra	Cerebral syphilis	1	2
Psychosis with organic brain disease	Psychosis with organic brain disease	1	
Pyelo-nephrosis	Psychosis with epilepsy		1
Syphilis, uncinariasis	Epilepsy		2
Tuberculosis of the lungs	Alcoholic psychosis	2	
Tuberculosis of the lungs	Cerebral syphilis	1	
Tuberculosis of the lungs	Dementia precox		3
Tuberculosis of the lungs	Dementia precox paranoid	1	
Tuberculosis of the lungs	General paresis	3	
Tuberculosis of the lungs	Imbecility	1	
Tuberculosis of the lungs	Infection exhaustive psychosis		1
Tuberculosis, meningitis	Dementia precox	1	
Total		26	17

TABLE XXIII.—CONTAGIOUS AND INFECTIOUS DISEASES.

Reported during the year 1919.

	Panama.	Colon.	Canal Zone.	Non-resident.	Total.
Acute contagious conjunctivitis, pink eye		14	8	1	23
Chickenpox	66	49	26	5	146
Diphtheria	54	70	32		156
Dysentery	55	4	21	22	102
Influenza	165	170	230	80	645
Leprosy	4	3	4		11
Malaria	181	139	1,270	524	2,114
Measles	185	53	58	5	301
Meningitis	4		6		10
Mumps	1	13	17	2	33
Pellagra	2	2			4
Pneumonia	55	32	31	22	140
Scarlet fever		1			1
Smallpox	53	8		4	65
Tuberculosis	302	121	49	26	498
Typhoid fever	8	8	5	11	32
Whooping cough	25	115	123		263
Yellow fever				2	2
Yaws	1				1

TABLE XXIV.—QUARANTINE TRANSACTIONS, PANAMA CANAL, 1919.

	Cristobal.	Balboa.
Vessels inspected and passed	1,637	1,199
Vessels detained in quarantine	15	65
Number of days held	16	157
Vessels given provisional pratique	9	56
Total vessels	1,661	1,320
Supplementary inspections of vessels in quarantine	1,307	121
Vessels fumigated for mosquitoes, SO_2	37	44
Vessels fumigated for rats, SO_2	55	14
Vessels fumigated for mosquitoes NaCN	2	1
Vessels fumigated for rats, NaCN		
Total vessels fumigated	94	59
Crew inspected on arrival	74,319	67,542
Passengers inspected on arrival	28,768	17,069
Crew passed on certificate of medical officer	41,990	4,719
Passengers passed on certificate of medical officer	[a]49,731	
Total persons inspected	194,808	89,330
Supplementary inspections of persons detained on vessels	2,527	6,148
Persons detained at quarantine station	1,964	2,219
Number of days detained for yellow fever	6,098	5,918
Number of days detained for plague	32	219
Number of days detained for other diseases	140	28
Total days	6,270	6,165
Persons detained on board vessels	4,315	8,604
Number of days detained for yellow fever	5,034	10,805
Number of days detained for plague	305	184
Number of days detained for other diseases	140	20
Total days	5,479	11,009
Persons vaccinated	1,269	446
Persons detained at station account immigration laws	14	121
Number of days detained under immigration laws		585
Persons deported under immigration laws	293	51

[a] Include 32,709 allied troops.

QUARANTINE TRANSACTIONS—BOCAS DEL TORO, 1919.

Number of vessels inspected and passed	297
Number of crew inspected and passed	7,871
Number of passengers inspected and passed	3,736
Number of passengers in transit inspected and passed	3,660
Number of persons vaccinated on coastwise vessels	470

TABLE XXV.—FORCE REPORT.

	December 31, 1919.			1918.	1917.
	Gold.	Silver.	Total.		
Chief health office	3		3	4	3
Medical storehouse	4	4	8	9	[illegible]
Quarantine service	10	37	47	48	[illegible]
Health office, Panama	10	154	164	158	167
Health office, Colon	16	157	173	135	[illegible]
Ancon Hospital	131	237	368	338	[illegible]
Colon Hospital	21	34	55	50	[illegible]
Santo Tomas Hospital	6		6	6	6
Palo Seco Leper Asylum	2	38	40	34	37
Quarantine station	5	218	223	168	[illegible]
Corozal Hospital and farm	15	98	113	114	[illegible]
Detectives	8	8	16	25	22
Total	231	985	1,216	1,109	1,[illegible]

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REPORT

OF THE

HEALTH DEPARTMENT

OF

THE PANAMA CANAL

FOR THE

CALENDAR YEAR

1920

H. C. FISHER

Colonel, Medical Corps, United States Army (Ret.)
Chief Health Officer

REPORT

OF THE

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Chief Health Officer

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THE PANAMA CANAL.

HEALTH DEPARTMENT.

Operating under the direction of the Governor of The Panama Canal. Maintained from funds designated for sanitation in Panama Canal appropriations and revenues derived from its own operations. It exercises jurisdiction in health matters over the Canal Zone and the cities of Panama and Colon, Republic of Panama, and also cooperates with the Panaman Government in health matters in other parts of the Republic.

LETTER OF TRANSMITTAL.

THE PANAMA CANAL,
HEALTH DEPARTMENT,
BALBOA HEIGHTS, C. Z., March 17, 1921.

Col. JAY J. MORROW,
Governor, The Panama Canal,
Balboa Heights, Canal Zone.

SIR: I have the honor to submit the following report of the operations of the health department for the year 1920.

Respectfully,

H. C. FISHER,
Chief Health Officer.

HEALTH DEPARTMENT.

ORGANIZATION AND OPERATION.

The organization of the health department consists of:

- Chief Health Office, Balboa Heights:
  - Division of Hospitals and Charities—
    - Ancon Hospital, Ancon.
    - Colon Hospital, Colon.
    - Corozal Hospital, Corozal.
    - Santo Tomas Hospital, Panama, R. P.
    - Palo Seco Leper Asylum, Palo Seco.
    - Dispensaries at—
      - Colon Hospital.
      - Gatun.
      - Pedro Miguel.
      - Ancon Hospital.
      - Balboa.
    - District Dentists at—
      - Colon.
      - Gatun.
      - Pedro Miguel.
      - Ancon.
      - Balboa.
      - La Boca.
    - Medical Storehouse, Ancon.
  - Division of Sanitation—
    - Health Office, Panama.
    - Health Office, Colon.
    - Chief Sanitary Inspector, Canal Zone, Balboa Heights—
      - District Sanitary Inspectors at—
        - Gatun.
        - Pedro Miguel.
        - Ancon.
        - Balboa.
  - Division of Quarantine—
    - Chief Quarantine Office, Balboa Heights.
    - Quarantine Station, Colon.
    - Quarantine Station, Fort Amador.
    - Quarantine Station, Bocas del Toro.

PERSONNEL.

(December 31, 1920.)

Chief Health Office.

Balboa Heights.

Col. H. C. Fisher, U. S. Army, Chief Health Officer.
Dr. D. P. Curry, Assistant Chief Health Officer.

DIVISION OF HOSPITALS AND CHARITIES.

Ancon Hospital.

Col. L. T. Hess, U. S. Army, Superintendent.
Dr. T. W. Earhart, Chief of Surgical Clinic.
Dr. W. E. Hubbard, Assistant Chief of Surgical Clinic.
Dr. R. C. Connor, Chief of Medical Clinic.
Dr. W. W. Braithwaite, Assistant Chief of Medical Clinic.
Dr. A. F. Ryan, Chief of Eye and Ear Clinic.
Dr. T. H. Odineal, Assistant Chief of Eye and Ear Clinic.
Dr. L. S. Townsend, Chief of X-ray Clinic.

Physicians.

Dr. George Eugene.
Dr. H. G. Hambleton.
Dr. L. S. Chapman.
Dr. M. A. V. Smith.
Dr. D. L. Hollis.
Dr. C. D. Briscoe.
Dr. H. K. Tuttle.
Dr. P. G. Pomeroy.
Dr. James Burrow.

Internes.

Dr. H. S. Liggett.
Dr. F. E. Hyde.
Dr. R. L. Ross.
Dr. J. G. Stoelzle.
Dr. H. G. Campbell.

Board of Health Laboratory.

Dr. L. B. Bates, Chief of Laboratory.
Dr. H. C. Clark, Pathologist.
Capt. J. H. St. John, U. S. Army, Bacteriologist.
Mr. J. E. Jacob, Chemist.
Mr. L. H. Dunn, Entomologist.

Corozal Hospital.

Dr. Louis Wender, *Superintendent.*

Physicians.

Dr. D. G. O'Neil.
Dr. D. G. Sampson.

Colon Hospital.

Maj. T. J. Leary, U. S. Army, Superintendent.

Physicians.

Dr. W. V. Levy.
Dr. W. W. Cook.
Dr. J. C. Scott.
Dr. J. S. Vance.

Internes.

Dr. F. R. Brunot.
Dr. Wayne Gilder.

Santo Tomas Hospital (Panama).

Maj. E. A. Bocock, U. S. Army, Superintendent.

Physicians on Panama Canal Roll.

Dr. C. C. Phillips.
Dr. N. B. Kupfer.

Palo Seco Leper Asylum.

Mr. F. D. Tucker, Superintendent.

Cristobal-Colon Dispensary.

Dr. W. V. Levy, District Physician.

Gatun Dispensary.

Dr. J. A. Grider, District Physician.

Pedro Miguel Dispensary.

Dr. W. B. Meares, District Physician.

Balboa Dispensary.

Dr. I. E. Hix, District Physician.
Dr. L. O. Keen.
Dr. R. L. Harvey.
Dr. J. R. Ernst.

Ancon Dispensary.

Dr. W. K. Olson, District Physician.
Dr. H. G. Bickford.

DIVISION OF SANITATION.

Panama Health Office.

Dr. Henry Goldthwaite, Health Officer.

J. M. Carpprow, Sanitary Inspector.
C. L. Pierce, Sanitary Inspector.
N. C. Anderson, Sanitary Inspector.
O. W. Searcy, Sanitary Inspector.
B. C. Quinby, Building Inspector.
H. A. Lewis, Vaccinator.
Dr. F. T. Eisenman, Veterinarian and Meat Inspector.
Dr. H. L. Casey, Veterinarian and Meat Inspector.

Colon Health Office.

Dr. J. L. Byrd, Health Officer.

C. H. Bath, Sanitary Inspector.
T. A. Leathley, Sanitary Inspector.
M. M. Seeley, Sanitary Inspector.
E. K. Turner, Sanitary Inspector.
Geo. Campbell, Sanitary Inspector.
W. S. Chidester, Sanitary Inspector.
Emil Becker, Sanitary Inspector.
Dr. I. C. Mattatall, Supervising Veterinarian and Meat Inspector.
Dr. W. F. Gross, Veterinarian and Meat Inspector.
Dr. F. F. Dowd, Veterinarian and Meat Inspector.

Canal Zone Sanitation.

E. F. Quimby, Sanitary Inspector, Gatun District.
I. W. Pickett, Sanitary Inspector, Pedro Miguel District.
Geo. L. Willett, Sanitary Inspector, Ancon-Corozal District.
John P. Corrigan, Sanitary Inspector, Balboa District.
J. L. Tolar, Sanitary Inspector (Relief).

DIVISION OF QUARANTINE.

Chief Quarantine Office.

Balboa Heights.

Surgeon W. C. Rucker, U. S. P. H. S., Chief Quarantine Officer.

Cristobal-Colon Quarantine, Cristobal, C. Z.

Dr. C. A. Hearne, Quarantine Officer.
Dr. E. T. Lake.
Dr. E. W. Torrey.
Dr. P. Horwitz.

Balboa-Panama Quarantine, Fort Amador, C. Z.

Dr. J. D. Odom, Quarantine Officer.
Dr. J. C. Hubbard.

Bocas del Toro (R. P.) Quarantine.

Dr. W. J. Burke, Quarantine Officer.

VITAL STATISTICS.[1]

EMPLOYEES.

The average number of employees on the rolls of The Panama Canal and the Panama Railroad, for the year was 20,673, as compared with 24,204 for 1919, and 25,520 for 1918.

The total admission rates to hospitals and quarters was 671.84, as compared with 550.21 in 1919, and 405.67 for 1918. For disease alone the admission rate to hospitals was 183.91, as compared with 176.09 in 1919, and 136.60 in 1918. The total admission rate to hospitals only was 221.35, as compared with 210.92 in 1919, and 163.17 in 1918. (*See* Chart No. 1.)

The total death rate was 8.70, as compared with 7.23 in 1919, 8.11 in 1918, 7.09 in 1917, 6.03 in 1916, 5.77 in 1915, and 7.04 in 1914. The death rate from disease alone was 7.40 as compared with 6.20 in 1919, and 7.13 in 1918. (*See* Chart No. 2.)

The constantly noneffective rate from all causes was 14.87, as compared with 14.29 in 1919, and 11.02 in 1918. (*See* Chart No. 3.)

The admission rate for malaria, to both hospitals and quarters, was 19.40, as compared with 31.07 for 1919, and 18.55 for 1918. The noneffective rate for malaria was 0.45, as compared with 0.99 for 1919, and 1.13 for 1918. (*See* Charts 4, 5, and 6.)

The admission rate for typhoid fever was 0.24, as compared with 0.17 for 1919, and 0.24 for 1918. Three deaths from typhoid fever among employees occurred during the year.

The five diseases causing the highest number of hospital admissions with their rates, were as follows:

	1919.		1920.	
	Admissions.	Rate.	Admissions.	Rate.
Influenza	305	12.60	621	30.04
Venereal diseases	540	22.31	552	26.70
Malaria	678	28.01	401	19.40
Diseases of the eyes and their annexa	194	8.02	152	7.35
Tuberculosis (various organs)	81	3.34	82	3.97

The five diseases causing the highest number of deaths, with their rates, were as follows:

	1919.		1920.	
	Deaths.	Rate.	Deaths.	Rate.
Tuberculosis (various organs)	23	0.95	30	1.45
Pneumonia (broncho and lobar)	19	.78	22	1.06
Influenza	1	.04	21	1.02
Nephritis (acute and chronic)	21	.87	13	.63
Organic diseases of the heart	18	.74	11	.53

[1] All rates given are computed as equivalent annual per 1,000.

EFFECTS OF RACE.

The admission rate to hospitals and death rate from disease, for white employees, were 267.06 and 3.63 respectively, as compared with 159.53 and 8.51 for black employees.

The admission rate to hospitals and quarters for malaria was 20.05 for white employees, as compared with 19.21 for black employees.

The death rate from disease for Americans was 3.32, as compared with 1.08 for 1919, and 3.38 in 1918.

CANAL ZONE.

EMPLOYEES AND NONEMPLOYEES.

From an average population of 27,469 in the Canal Zone, there was a total of 242 deaths during the year. Of these, 211 deaths were from disease, giving a rate of 7.68 as compared with 7.81 for 1919, and 9.69 for 1918.

The death rate from tuberculosis was 1.02, as compared with 0.83 for the preceding year, and 1.84 for 1918. Tuberculosis caused 13 per cent of all deaths from disease during the year.

There were 631 live births reported during the year, giving a birth rate of 22.98. (*See* Table VII.) Of these 231 were white, and 400 were black. Of the total births reported, 5 per cent were stillbirths.

Deaths among children, under 1 year of age, from all causes, totaled 60, of which 8 were white, and 52 black; giving an infant mortality rate, based on the number of births reported for the year, of 34.36 for white, and 130 for black children, with a general average of 95.09 per 1,000 births.

Of the total deaths, 25 per cent occurred among children under 1 year of age, and 38 per cent among children under 5 years of age.

Below is a table showing the death rates for the Canal Zone from 1905 to 1920, inclusive, from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	23,463	828	35.29	1913	61,700	1,047	16.97
1906	34,095	1,700	49.86	1914	46,379	710	15.31
1907	54,036	1,708	31.60	1915	31,946	410	12.83
1908	67,146	1,273	18.95	1916	31,447	343	10.91
1909	76,900	1,025	13.33	1917	[a] 27,543	313	11.36
1910	86,465	1,251	14.47	1918	[a] 22,290	236	10.59
1911	90,434	1,385	15.32	1919	[a] 26,511	229	8.64
1912	79,279	1,129	14.24	1920	27,469	242	8.81

[a] Average population, excluding military population for last 6 months of 1917, the year 1918, and the first 6 months of 1919.

PANAMA CITY.

EMPLOYEES AND NONEMPLOYEES.

From a population of 60,500, based on a census taken this year by the Panamanian Government, there was a total of 1,297 deaths

during the year. Of these, 1,246 were from disease, giving a rate of 20.60, as compared with 18.98 for 1919, and 20.92 for 1918.

The principal causes of deaths as compared with the preceding year, were as follows:

	Deaths in—	
	1919.	1920.
Tuberculosis (various organs)	241	206
Diarrhea and enteritis (including colitis)	152	175
Pneumonia (broncho and lobar)	171	167
Nephritis (acute and chronic)	84	77
Premature birth	25	47
Cancer (various organs)	35	46

The death rate from tuberculosis was 3.40, as compared with 3.93 for 1919, and 4.14 for 1918. Tuberculosis caused approximately 16 per cent of all deaths from disease during the year, as compared with 20 per cent for the preceding year, and 19 per cent for 1918.

There were 2,376 live births reported during the year, giving a birth rate of 41.55. Of the total births reported, 6 per cent were stillbirths.

There were 369 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported during the year, of 155.30.

Of the total deaths, 28 per cent occurred among children under 1 year of age, and 40 per cent among children under 5 years of age.

Below is a table showing the death rate in Panama City from 1905 to 1920, inclusive, from all causes among both employees and nonemployees.

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	21,984	1,447	65.82	1913	47,172	1,507	31.95
1906	25,518	1,142	44.75	1914	53,943	1,863	34.53
1907	33,548	1,156	34.45	1915	60,373	1,810	29.96
1908	37,073	1,292	34.83	1916	60,778	1,765	29.04
1909	40,801	1,038	25.44	1917	61,074	1,714	28.06
1910	45,591	1,446	31.72	1918	61,369	1,314	21.41
1911	46,555	1,456	31.27	1919	61,369	1,211	19.74
1912	47,057	1,380	29.33	1920	60,500	1,297	21.44

COLON.

EMPLOYEES AND NONEMPLOYEES.

From an estimated population of 26,078, a total of 554 deaths occurred during the year. Of these, 517 were from disease, giving a rate of 19.82, as compared with 20.55 for the preceding year, and 22.51 for 1918.

The principal causes of death, as compared with last year, follow:

	1919.	1920.
Tuberculosis (various organs)	101	109
Diarrhea and enteritis (including colitis)	55	49
Nephritis (acute and chronic)	56	45
Bronchitis (acute and chronic)	38	37
Pneumonia (lobar and broncho)	74	36
Organic diseases of the heart	46	28

The death rate from tuberculosis was 4.18, as compared with 3.87 for the preceding year, and 4.45 for 1918. Of the total deaths from disease, tuberculosis caused 21 per cent.

There were 962 live births reported during the year, giving a birth rate of 38.88. Of the total births reported, 5 per cent were stillbirths.

There were 137 deaths among children under 1 year of age, giving an infant mortality rate, based on the number of births reported during the year, of 142.41.

Of the total deaths, 25 per cent occurred among children under 1 year of age, and 35 per cent among children under 5 years of age.

Below is a table showing the death rate in Colon from 1905 to 1920, inclusive, from all causes among both employees and nonemployees:

Year.	Population.	Deaths.	Rate per 1,000.	Year.	Population.	Deaths.	Rate per 1,000.
1905	11,176	553	49.48	1913	20,232	489	24.17
1906	13,651	703	51.42	1914	23,265	590	25.36
1907	14,549	571	39.24	1915	29,331	640	21.82
1908	15,878	418	26.32	1916	24,693	696	28.19
1909	17,479	396	22.65	1917	25,386	667	26.27
1910	19,535	514	26.31	1918	26,078	616	23.62
1911	19,947	527	26.42	1919	26,078	573	21.97
1912	20,174	493	24.44	1920	26,074	554	21.24

GENERAL REMARKS.

Malaria.—The number of admissions for malaria to hospitals and quarters shows a gratifying decrease from that of the previous year.

COMPARATIVE STATEMENT OF TOTAL NUMBER OF MALARIA CASES REPORTED DURING THE CALENDAR YEARS 1919 AND 1920.

	Employees.		Nonemployees.		Total.	
	1919.	1920.	1919.	1920.	1919.	1920.
Canal Zone, sanitated areas	236	138	637	438	873	576
Canal Zone, cattle camps, etc	301	111	28	6	329	117
Canal Zone, miscellaneous unsanitated areas	21	18	47	17	68	35
Colon	70	20	69	21	139	41
Panama	62	30	119	70	181	100
Miscellaneous outside Zone (unsanitated)	62	84	462	268	524	352
Total	752	401	1,326	820	2,114	1,221

The reduction in the total number of admissions is marked in every district, but more especially in those areas where the greatest effort and improvement have been made in sanitation. In the report for last year was noted the heavy infection at Colon and Cristobal, the cause being located in the large swamps that lie to the south and east of these cities. Direct flights of *Anopheles albimanus* and *tarsimaculata* were demonstrated to have occurred into the northern part of Colon from the Margarita Road swamp, over a distance of 2 miles, 1 mile of which was across the open water of Manzanillo Bay. The work of draining these swamps has been carried on steadily through the past year. The Army sanitary inspector has extended and elaborated his system of ditches in the Margarita Road swamps until this area is practically free from any extensive mosquito breeding places. Pastures lying within 1 mile of Mount Hope and the Cristobal dry dock were evacuated of their cattle and open drainage ditches installed.

The sanitary inspector of the Mount Hope district (Cristobal), having about completed the installation of earth ditches in most of his wet areas, has begun permanent construction by converting them into rock and tile drains where it is possible to do so, or by laying sectional half-round concrete bottoms where flat grades or absence of rock preclude the use of the covered tile. Not only has the malaria incidence shown a great decrease, but the capture of adult *anopheles* (a work carried on both as an index and as a valuable antimalarial measure) indicates that the sources of the great majority of these mosquitoes have been effectually controlled.

No new work has been done in the Gatun district, except for the change of the drains of a small area immediately adjacent to the west side of the locks from an open ditch system to rock and tile, and the filling of a small pond and a few unnecessary old ditches. The adult mosquito catch of the past wet season demonstrated that the draining (in 1919) of the large swamp west of the old French canal has abolished the chief source of the hordes of *anopheles* that annually had invaded this city. (*See* Report for 1919.)

The new Army camp at Fort Davis was completed and occupied in October. While the sanitation done by the Gatun district inspector affords a large degree of protection to this post, its situation north of Gatun, toward the low-lying swampy pastures of The Panama Canal dairy, will require much further extension of work in that direction in order to fully protect the camp.

The Pedro Miguel district is being further improved by conversion of open ditches in the adjacent former cattle pastures to rock-covered tile drains. The removal of the cattle from these pastures has greatly reduced the number of adult *anopheles* caught, and has also lessened the cost of control of these areas.

The Dredging Division, pumping from the canal prism spoil deposited there as a result of recent movements in the slide at Cucaracha, found it necessary to spill this material into the old Rio Grande valley opposite Paraiso. The heavier material was deposited satisfactorily, forming a porous fill that can be easily drained. The lighter material, however, was carried down the stream, to be deposited in the arm of Miraflores Lake adjacent to Pedro Miguel locks, converting much of this area into a shallow lagoon, barely covered by water, which, as vegetation becomes established, will

doubtless be converted into a troublesome and costly breeding place. The new channel of the Rio Grande (straightened and dug by the Health Department the previous year) was blocked, and the river once more became a shallow, widespread, meandering stream. Drainage ditches discharging into the stream were choked with silt, and this fine amorphous material completely filled the rock and tile band ditch at the foot of Paraiso hill, necessitating its removal. Thus was undone, in a few weeks, practically all of the excellent work of the previous year in this area by the district sanitary inspector. Following the withdrawal of the hydraulic dredge, the Dredging Division furnished the sanitary inspector a gang of men who cleaned out some of the ditches and did what was possible to restore the drainage system, but without being able to restore its former efficiency, nor will it be practicable to do so if, as seems likely, this area is to be used again as a dumping ground for spoil from the Canal. Under present conditions, only temporary expedients and costly maintenance can be attempted. The Chief Hydrographer has presented a plan for raising this arm of Miraflores Lake to the height of Gatun Lake (from 54 to 85 feet, approximately), thus giving the former an increase of depth of over 30 feet, and a considerably larger area. While this has been proposed mainly because of its effect on the water supply of Gatun Lake and the surges in the cut affecting shipping, it would greatly benefit the sanitation of Pedro Miguel, through the conversion of a large, wet area into a deep lake with fairly clean, steep banks.

In the Ancon-Corozal district nearly 10,000 feet of permanent rock-covered and open concrete ditches were constructed. The latter type of construction—that of the open half-round, sectional, concrete ditch bottom, as described in the report for 1918, of which several thousand feet have been installed, has not been found as satisfactory as was at first hoped. In the jungle, where there are many large deciduous trees casting their foliage, these drains easily and frequently become blocked, allowing the formation of many small collections of water, and requiring to be cleaned frequently. Although more easily swept and maintained than open earthen ditches, the constant care necessary to prevent breeding during times of slight precipitation makes them a constant source of danger and expense; therefore most of the ditches of this type are being closed in by sectional cast covers and broken rock. In future construction practically all permanent work will be done with 6- or 8-inch concrete tile, made by this department, and covered with broken stone. Only in the Mount Hope district, where there are large, nearly flat, alluvial marshes, and where there is a scarcity of stone, will the open form of concrete ditch be constructed to any great extent.

Fort Clayton, north of Corozal, was finished and occupied in October. A number of malaria cases have developed there among the enlisted personnel and the catch of adult *anopheles* has been large. The Army sanitary inspector has devoted his efforts to clearing the jungle from the edges of streams and in valleys adjacent to the post, and has uncovered many springs, obstructed streams and seepage places. The Rio Cardenas, flowing by the south side of the camp, has many pools caused by bars, rocks, and drift, overhung with grass, in which prolific breeding occurs. These conditions are being

corrected as rapidly as time and funds permit, with considerable improvement already to be noted in the malaria and *anopheles* index.

In the Balboa district the large hydraulic fill west of the Canal, opposite Pier 18, has given rise to *anopheles* breeding in those parts where fresh water from the high land at the back runs out over the fill. Some of this material is still too soft to bear the weight of a man and it has been found possible to spread a mixture of black oil and larvacide by throwing waste, soaked in the mixture, out onto the fill.

In order to determine whether malaria occurs on vessels visiting Canal ports or transiting the Canal, the Surgeon General of the Navy was requested to have medical officers of Navy ships visiting the Canal report directly to the Chief Health Officer any cases of malaria developing aboard ship following such visit. Blanks for reporting cases have been prepared and will be supplied to the ships by quarantine officers on arrival.

The Panama Health Officer still emphasizes the need for sanitating the Sabanas area east of the city. The greater number of cases occurring in Panama live in the San Miguel and Calidonia districts, east of the Panama Railroad, and near the Sabanas car line. Doubtless many of these cases are contracted directly from visits to the unsanitated areas, but there is also the probability that *anopheles* fly into the city from the Sabanas. These sections of the city are occupied mainly by West Indians living in unscreened tenements.

In the foregoing table, the only increase in number of malaria cases is in that of employees contracted in "miscellaneous unsanitated areas outside the Zone." It has required frequent reminders to the residents of the Zone, that, although malaria is not so prevalent in the sanitated areas as it once was, the danger exists in other sections of the Isthmus in unabated form. In fact, the comparative safety of the sanitated areas does much to lull their apprehension of other areas and many carelessly take risks that are unjustifiable.

Malaria from cattle camps and plantations also shows a marked reduction, believed to be due largely to the continued use of prophylactic quinine. While it is admitted that this procedure is not ideal, and that, under ordinary circumstances, there are better ways of controlling malaria, the isolation of these camps, their temporary nature, and the class of labor (these being largely recruited from the infected native population) seem absolutely to require the use of quinine. Every evening for the first two months following the beginning of employment, each man is given 2½ ounces of an alcoholic solution, containing 10 grains of quinine sulphate. After this first period of 2 months, each man is given the same dose morning and evening of each Wednesday as long as he remains in camp. While this treatment is not compulsory, by the cooperation of the foremen it is fairly well carried out, and the malaria incidence has been lowest in those camps where the prescribed measures have been followed closely.

For the sterilization of malaria carriers and the "follow up" treatment of cases of malaria the Chief Health Officer has approved, as the standard for routine treatment, the administration of 10 grains of quinine sulphate by mouth, every evening before retiring for a period of 8 weeks. This is the procedure recommended by the subcommittee on medical research of the National Malaria Committee.

Malaria at Army posts.—The Department Surgeon of the Army reports a gratifying improvement in the malaria rate of troops on the Canal Zone, the rate for 1920 being better than in any previous year.

The comparative rates for the past 3 years are:

	1920.	1919.	1918.
Noneffective rate per 1,000	1.12	2.43	1.92
Admission rate	47.38	54.37	66.037

For the control of mosquito breeding the Army sanitary inspector reports that, as part of the permanent work with the allotment for this purpose, drains and fills were made by him as follows:

Station.	Dirt drains.	Concrete drains.	Rock and tile.		Fills.
			6" tile.	8" tile.	
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Cu. yds.*
Corozal	2,295	1,902	2,095	139	665
Fort Clayton	135	.....	428	.....	200
Panama secondary	1,200	.....	.....	.....	.....
Fort Davis	2,000	.....	.....	.....	1,000
Fort Sherman	11,223	.....	2,791	575	1,350
France Field	19,734	.....	.....	.....	.....
Fort Randolph	24,436	.....	.....	.....	.....
Totals	62,203	1,902	5,314	714	3,215

Typhoid fever.—There were 36 cases of typhoid fever, of whom 9 died. Five employees, 11 nonemployee residents of the Isthmus, and 19 nonresidents had the disease. Of these, 3 employees (black), 1 nonemployee (black), and 5 nonresidents (4 black, 1 white) died. The nonresidents were all ill upon arrival on ships and did not become infected upon the Isthmus. The cases developing locally were sporadic, except for 4 cases in one family from a small pueblo in the country near Panama City. No other cases developed in that vicinity after the discovery of the infection.

Every local case was carefully investigated as to its origin; contacts were examined for typhoid bacilli, resulting in the discovery of but 2 carriers, 1 an enlisted man in the Army and the other a patient of the hospital for the insane.

Influenza.—There were 1,314 cases of influenza reported from the Canal Zone and adjacent territory, of whom 62 died (*see* Tables IV, X, and XXIII).

The epidemic started the first part of March, 1920. Cases of influenza were reported as follows: March, 801; April, 314; May, 40; June, 138. The first cases were from Colon, but later cases were reported also from all parts of the Canal Zone and Panama and its suburbs. The schools, picture shows, and other places of assembly were closed for a period of 2 weeks. The majority of cases reported were among people who were ill-fed and physically weak—owing to

their poverty—which condition was markedly prevalent immediately after the strike of February 24 to March 4. The epidemic probably started from the fleet of United States Navy vessels stationed in Colon Bay from February 19 to March 1, of which the steamship *Colombia* had 10 cases and the steamship *Pennsylvania* 5 cases on board; the fleet reported 30 cases before arrival in Colon. The rise shown in number of cases reported during the month of June was the result of a local epidemic at the cattle pasture camp at Manawa, there being 82 cases from this camp during June. On March 21, 1920, a ship from Ecuador was received at Balboa quarantine with 6 cases of influenza on board; June 23, 1920, a ship from Peru was received at this station with 23 cases on board; in both instances the local passengers were detained in quarantine 3 days, and the crew and other contacts among agents and port employees were observed and temperatures taken for 3 days. No new cases developed.

Smallpox.—There were reported 25 cases of smallpox during the year, 14 from Panama City and 11 nonresidents. The disease did not at any time become epidemic. The chief source of the infection is from the interior of the Republic, in which smallpox remains endemic, as but few native Panamans outside the cities of Colon and Panama are vaccinated. There were no deaths from smallpox.

Rats and anti-plague work.—Second only to malaria control is the problem of rendering the Isthmus safe from an invasion of bubonic plague. But two cases have originated on the Isthmus since the American occupation. (In 1905 at La Boca, 2 laborers developed the disease and died. A vigorous rat campaign in the vicinity followed and but one infected rodent was found. Apparently the disease was stamped out.)

But bubonic plague exists in North, Central, and South American ports, necessitating strict care in quarantine and internal measures against rats. In building Panama Canal piers and docks every precaution was taken to make them rat-proof. In addition to rat-proof construction of buildings, a circular of the Governor requires all building material, forage, and other stores to be placed so as to discourage rat harboring and favor their elimination. One of the most valuable measures is the placing of practically all kinds of materials on elevated racks, with a minimum of 12 inches clear space below, with open aisles at short intervals between, permitting inspection, trapping, and poisoning and also discouraging the wary rodent from nesting therein. In keeping food from rats the utmost vigilance is exercised. In shops and warehouses have been designated certain places only in which the men may eat their lunches so as to facilitate the collection and removal of all scraps of food. The keeping of chickens and pet animals in the Zone is restricted in order not to furnish food for rats.

Evidence accumulates as to the very large quantity of rats living in the jungles and pastures. At times migrations seem to occur and they have been seen swimming in large numbers in the Canal and lock chambers. The sylvan rat is not so wary as his city brother and is easily seen and caught. During clearing operations about one of the new Army camps the laborers killed hundreds of rats daily. A number of these rats were captured and they and their fleas have been sent to the Bureau of Biological Survey at Washington for identification. Fleas are numerous on the jungle rats.

apping and poisoning is regularly done in the terminal cities, ly to obtain rats for the laboratory, to which all rats, alive or (if not too badly decomposed) are sent for examination. No ue-infected rats have been found.

the poisons used, barium carbonate has proved most effective. y ways of preparing the poisoned baits were tried, in addition ie routine methods of mixing with meal, flour, or chopped fresh t. In one commissary storehouse, the powder sprinkled on a cantaloupe caused the death of 24 rats in one night. The health er of Colon reports the best results, as well as facility in handling baits, from mixing the barium carbonate in proper proportions ough and baking as a loaf of bread. Split cucumbers, with the der sprinkled inside, also proved alluring to the rodent appetite. was also attempted to catch rats by means of a viscous, slowng varnish spread on baited metal plates, hoping thereby to h not only the rats, but their fleas as they left the dead bodies. method proved more efficacious in catching mice, as the rats generally too wary to become entangled in the varnish. It was vn, however, that once a rat stepped upon the plate his death certain.

rbage disposal.—The new incinerator at Colon was completed ciently to place it in operation in September.

t this incinerator is destroyed all the garbage of the cities of Colon Cristobal. Previously the garbage had been burned in the open lumps, and later, on a temporary, unsheltered, rail incinerator. ing the rainy season especially it was very difficult to destroy the age by these methods; flies were bred abundantly and numbers its were attracted and fed. Following the beginning of operas by the new incinerator the fly infection of the two cities was ibly decreased and now the district is as comparatively free 1 flies as can be expected.

he incinerator on Gavilan Island, destroying garbage from ama, Ancon, Balboa, Amador, and other places at the Pacific ninal of the Canal, was closed for repairs in December, necessiig, for the time being at least, other methods of handling the bage. The Health Officer of Panama undertook to dispose of this erial on the dump near the beach just outside the city. Each 's collection was brought out in the morning, beginning very y. Every load as it arrived and was dumped was thoroughly ayed with a solution of larvacide (crude phenol, lye, resin soap id) to destroy adult flies and as many larvæ as possible. After ing on the dump and leveling it off, the garbage was covered 1 4 to 6 inches of earth to prevent infection by flies. Twice y thereafter, for 10 days following placing in position, the sur- of the dump was sprayed with the larvacide solution. The lts were surprisingly good. Large areas of low wet land were d, with some subsequent sinking, of course, but not enough to ore their bad features. Nuisance from odors and unsightliness not develop. Some flies, of course, emerged and escaped with- being destroyed, but there was nothing like the tremendous ding that occurred at Colon when garbage was burned in the n. Rats have not been apparent about the dump. Possibly are repelled by the crude carbolic acid emulsion spray with ch the ground is sprinkled. The operation of the dump proved e much *cheaper than* incinerating.

Should it prove advisable to continue this method of garbage disposal, there are troublesome low areas, such as the ditches alongside the Curundu River flume, that can be filled with garbage and other refuse, with great permanent advantage to the sanitation of those places.

Venereal disease campaign.—In its basic elements the venereal disease situation remains practically unchanged. Situated at the terminals of the Panama Canal, the cities of Colon and Panama are daily visited by hundreds of seamen of commercial vessels of various nationalities and sailors of the United States Navy, and also by soldiers of the United States Army on the Canal Zone. The constant influx of this type of transient males is naturally calculated to attract a multitude of prostitutes from other countries, as well as native ones, who, learning of the rich harvest to be reaped here, and the light restrictions on their freedom, consider these cities fruitful fields for their activities. A very large proportion of these women, as may be expected, are infected with venereal diseases.

Intimately associated as are the Americans and others living on the Canal Zone with the two Panamanian cities, the problem of venereal disease causes the greatest concern to the authorities of the Canal. Since 1904 there have been about 30,000 cases of venereal diseases among employees and their families treated by Canal physicians. Doubtless a great number of infections escaped being treated and reported.

At a meeting of representative American and Panamanian citizens in 1919 was adopted the "Program of Attack on Venereal Disease" as outlined by the Surgeon General of the United States Army during the World War; but this program has never been satisfactorily carried out because of the radically different viewpoint of the Panamanian people.

In the beginning of the campaign it was not considered advisable to attempt radical law enforcement measures. Effort was directed toward means for diagnosis, treatment and prophylaxis of venereal disease, and toward a general campaign of education to build up sound and clean public opinion, hoping that proper laws and their enforcement might be a later development.

Venereal disease clinics were established at Colon and Panama. The clinic at Colon, opened March 1, 1920, is maintained by the American Red Cross. The Panama clinic was opened August 25, 1919, at Santo Tomas Hospital.

The Colon venereal clinic.—In the 10 months of operation of the Colon venereal clinic, 666 patients were admitted, classified as follows:

	Men.	Women.
Syphilis	56	34
Gonorrhea	183	57
Chancroid	71	25
Syphilis and gonorrhea	8	2
Gonorrhea and chancroid	6	1
Syphillis, gonorrhea, and chancroid		1
Miscellaneous (nonvenereal)	45	125

	Men.	Women.
Arsphenamine (doses given)	94	364
Mercury injections	18	256
Discharged apparently cured	37	60
Average number of visits to clinic	4	(1)
Sent to hospital for treatment	12	101
Dark field examinations	10	5
Prophylactic treatments	340	.....

Wassermann tests: Ninety-one positive, 261 negative, 26 doubtful.

Although the above table shows a fraction less than 58 per cent of the women to be infected, this figure is conservative and probably misleading, as wherever a record is doubtful it is counted as a negative. It is also realized that of the 60 "apparently cured" cases a number may remain infectious, because of the known difficulty of curing chronic gonorrheal endocervicitis by topical applications, and also from the fact that the women usually take a chemical douche before coming to the clinic for examination. Three successive negative smears are required before the case is discharged.

The average number of visits of infected men to the clinic was so small that but little benefit could be expected from the treatment given. Not a man ever completed the course of antisyphilitic treatment. The chief progress was achieved with syphilitic women, most of whom, being compelled to come to the clinic, received sufficient treatment to render them noninfectious for the present at least.

The Panama venereal clinic.—The work of this clinic at Santo Tomas Hospital has been especially valuable. At first but one physician and two nurses were employed, but as the work grew it became necessary to add a second physician to the staff. From an average of 30 or 40 patients daily, the number has grown to over 100 a day, men and women coming on separate days.

The fee for service in the clinic is 10 cents for each applicant registered. This purchases an admission ticket which thereafter entitles the holder to entrance to the clinic. Drugs or prescriptions to be taken to the patient's home are sold at actual cost and patients that are absolutely unable to pay are given free medicine. No charge is made for medicines or dressings used in the clinic. For Wassermann tests the fee is $2 when the patient is able to pay, but it is given without charge to the poorer patients. Salvarsan is sold at varying prices; to patients who are well able to pay, $5 per dose is charged; patients unable to pay full price, but capable of contributing something, are charged $2 per dose; charity cases are furnished free injections when they have no money and would be a menace to the public health if left untreated. Spinal punctures are charged for in the same manner and at the same rate as the Wassermann tests. At present the receipts from the clinic are sufficient to meet all its expense and it is now entirely self-sustaining.

All laboratory work for the clinic is done by the laboratory of the hospital and prescriptions are filled and stock remedies supplied by the hospital pharmacy.

A complete record of every case is kept by the nurse in charge of the records of the clinic. Patients are given literature covering the

[1] Attendance compulsory.

principal points in their disease, and advice as to how to get well by carrying out certain measures and how to prevent the spread of their disease to noninfected individuals. Every new case is investigated in order to locate the source; when the origin can be found, the infected individual is rounded up by the police and held in the detention ward at the hospital for treatment.

In connection with the department of treatment a prophylactic station is maintained and kept open day and night. This station has been widely advertised to the local population and to all incoming ships, and many sailors have taken advantage of the privilege. Since the clinic has been in operation 3,263 prophylactic treatments have been given to men of many nationalities.

A third department is also operated by the clinic, in which all prostitutes that report under the provision of Degree No. 12 of 1918 (Panama) are examined. Under existing laws all these women are supposed to report weekly for examination, but this state of affairs has never yet been, and never will be, realized. By working in connection with the health officer of the city and the inspector of police, it has been possible to increase greatly the number of prostitutes who report weekly. In the beginning only a small number came, but at present this has about been trebled, and the outlook is encouraging. A physical and microscopical examination is made on each case, and every woman found in an infectious state is confined to the hospital for treatment. The noninfected individuals are allowed to return to their abodes. Free antiseptics are furnished these women to take to their homes, with instructions as how they are to be used, and at each weekly visit to the clinic they are questioned regarding their supply and its application.

While in the hospital the infected women are not idle, since a large workroom has been established in which they are made to sew, roll bandages, and pack gauze and cotton, while being treated. It is found that this exercise tends to encourage these people and to maintain them in a more cheerful and tractable frame of mind. It is shortly planned to add a small hand laundry to the work which they are now doing. In addition to helping the hospital while they are confined there, it is hoped to teach at least a part of them an occupation, and later to secure positions for them, so that it will not be necessary for them to return to their former lives upon release from the hospital.

In the accompanying report of Santo Tomas Hospital (q. v.) are given the statistics of the work of the clinic for the year 1920.

It is felt that the educational advantage of the clinic can not be overestimated. Patients report to the clinic from homes which are in many instances wonders of squalor, filth, and disorder. Some of them have been previously treated by quack doctors or by physicians poorly equipped both in knowledge and appliances. To visit a clean, well-furnished room, equipped with shining modern appliances and in charge of a competent physician and nurse, works a wonderful transformation in the minds of these patients. They feel that something worth while is being done for them, and the mental attitude is so much improved that their physical condition reacts accordingly. The patient is made more hopeful, and not only does he return as directed until his condition is improved, but he spreads the news of his recovery to many people of his acquaintance.

While the results that have been accomplished are gratifying, it is thoroughly realized that the field has hardly been touched. So widespread is the feeling in the Republic that prostitution is a necessary evil and that venereal disease is of little consequence, that it is practically impossible at the present time to carry on a campaign that will accomplish more than a limited amount of good results. The best that can be hoped for now is to spread as much favorable propaganda as possible and to attempt to educate the people to a point where, a little later, laws may be enacted which will bring about the abolition of commercial prostitution. At present the lawmakers as well as the populace are against any attempt at abolition; consequently it would be futile even to think of accomplishing it under the present government. However, by carrying on the educational work in a vigorous manner for a few years, it is felt that it may ultimately be possible to secure the passage of laws which will eliminate recognized prostitution from the city and limit to a minimum the incidence of venereal disease.

Examination of school children.—The annual physical examination of school children of the Canal Zone was made, starting in October. The results for the white children were as follows:

Number of children examined	1,835
Number found needing treatment	860
Number with defective teeth as only defect	398
Number with defects other than teeth only	462
Defects found	935
Teeth	519
Vision	143
Hearing	12
Nasal breathing	33
Hypertrophied tonsils	167
Orthopedic	4
Pulmonary	2
Malnutrition	3
Cardiac	11
Chorea and other nervous diseases	3
Contagious diseases	10
Miscellaneous	28
Number vaccinated	193

The parents were notified in each case when defect was found, and advised as to proper treatment either by the district physician, in a Panama Canal hospital, or by a dentist. Of the total 935 defects found, but 221 were *reported* as having been treated. This can not be accepted as an accurate figure, however, as treatment was undoubtedly given in many cases, but not reported to the district physician who made the original physical examination. No record was kept of the defects found in the colored children, but proper advice was given at the time of examination by the district physician.

PANAMA HEALTH OFFICE.

(Dr. HENRY GOLDTHWAITE, Health Officer, Panama City.)

Malaria.—The following table of malaria cases charged to the City of Panama for the years 1914 to 1920, inclusive, shows practically the result of intensive work on the part of this office:

1914	2,154
1915	614
1916	235
1917	187
1918	97
1919	181
1920	100

There is no reason to believe that the source of infection in the 100 cases reported for the year just passed, charged to the City of Panama, was from within the city; as it is hardly possible for *anopheles* to come to maturity within the district under charge of this office, the infection doubtless comes from areas beyond our present control. The consumption of crude oil by this office per annum shows graphically fills made and ditches straightened and eliminated:

ANNUAL CONSUMPTION OF OIL.

	Gallons.
1917	44,806
1918	15,701
1919	17,828
1920	9,365

Attention is again invited to the necessity for the sanitation of that district near the city known as "Las Sabanas"; the district in question is more or less thickly populated, from the terminus of our present sanitated area, the Tumba Muerta Road, to the Rio Abajo. The area could be sanitated without much trouble, and at a moderate expense. This should be done not only for the benefit of the Panamanians but for the many employees of The Panama Canal who use the Sabanas Road for pleasure trips; the use of this road will constantly increase, with a corresponding increase in the cases of malaria, as the improvement of the Sabanas Road progresses toward Chepo.

Infant mortality.—The following shows the annual death rate of infants under 1 year of age for the years 1914 to 1920, inclusive:

	Rate per thousand.
1914	272
1915	221
1916	235.86
1917	237.73
1918	188.27
1919	158.47
1920	156.30

Smallpox.—A total of 14 cases of smallpox was reported as having occurred in the city of Panama during the year 1920; these cases all originated from points outside of the city. During the year 17,294 persons were vaccinated by this office. Many of these vaccinations were done on persons entering the City of Panama by water from other parts of the Republic, which is beneficial in so far as it relieves us of the care of smallpox patients and, of course, is gradually lessening the danger of infection from the interior.

There was issued a total of 3,205 vaccination cards to persons leaving the Republic by sea. The majority of these individuals were West Indians.

Veterinary work.—Fees collected as a result of the work of veterinarians attached to this office amounted to $3,586.99, which sum includes fees collected for inspection of cattle and swine and disinfection of hides and skins.

There were 15,023 head of cattle and 11,402 hogs killed and inspected at the Panama abattoir under the supervision of our veterinarians. Of these the following were condemned: *Cattle*—Septicemia, 8; anthrax (died in pen), 3; infiltration and ecchymosis, 3; sunstroke, 2; tuberculosis, 1; gangrene, 1; asphyxia, 1; steers

(cause not stated), 5; total, 24. *Hogs.*—Measles, 609; sunstroke, 59; sucklings (cause not given), 18; cholera, 10; gangrene, 3; tuberculosis, 2; tetanus, 2; pyemia, 2; urtricaria, 1; pneumonia, 1; total, 707.

Flies.—The use of fly paper and fly traps has practically been abolished by this office. We are using instead wires, dipped in what might be termed "tanglefoot mixture." This method seems to be more successful, but of course the main point in the elimination of flies is in the destruction of their breeding places. This is being continually done, but no city of this size can ever hope to be absolutely flyless, and it is a constant fight.

Milk and dairies.—The milk situation continues to improve. A more or less flexible standard of 300,000 bacteria per cubic centimeter for raw milk has been set by this office, and the present bacterial count shows many samples having considerably less than 100,000 bacteria per cubic centimeter. With the passage of time, the dairy owners are becoming aware of the fact that cleanliness means more money to them. It is but a repetition of the history of all cities where supervision of the milk supply has been attempted. Possibly we have had less trouble than in any place in the United States of similar size, mainly for the reason that the orders from this office are mandatory, and there is practically no appeal therefrom.

The "Lecheria Central," or central plant to which all milk from the various dairies is sent, was opened for service in January, 1920, since which time no milk has been sold in the city except that which is pasteurized at this plant. The lecheria is owned and operated by the dairymen's association. A limited quantity of clean, fresh butter is also produced by the plant. As soon as an adequate supply of bottles of the standard size (1/5 gallon) can be secured it will be required that all milk be also bottled at the plant and that no loose milk be sold.

Fines.—There were 1,425 fines imposed for violation of sanitary regulations and $2,684.50 collected as a result thereof.

Garbage disposal.—At the time this report is written we are burying all garbage from the City of Panama and the terminus of the Canal, owing to the necessity for extensive repairs on the Gavilan Island incinerator. This method of disposal is being done at an approximate cost of $1,265 per month for the total work, as against a 3-year average of $2,410.64 per month for incineration of the garbage from the City of Panama alone.

Venereal diseases.—During the year 395 cases of syphilis were reported to this office and 1,111 cases of gonorrhoea; this by no means represents the actual total, as it is almost an impossibility to have physicians report their venereal cases; constant urging seems to have little effect upon them.

Tuberculosis.—The number of deaths from tuberculosis for the years of 1914 to 1920 inclusive, are as follows:

1914	229
1915	245
1916	313
1917	348
1918	254
1919	241
1920	206

The Health Officer is of the opinion that the number of deaths from tuberculosis will be largely reduced if we can enforce the regulation requiring each person to have at least 300 cubic feet of air space in living quarters. The enforcement of this regulation would not only tend greatly to reduce the number of deaths from tuberculosis but should naturally result in a reduction in the infant mortality rate.

COLON-CRISTOBAL HEALTH OFFICE.

(Dr. J. L. BYRD, Health Officer.)

The new concrete Panama Railroad stables, thoroughly rat-proof, offering every facility for cleanliness, and affording accommodation for all the privately owned animals of the city, were completed during the year and all the old unsanitary private stables in the city have been demolished.

The new garbage incinerator was placed in operation on September 1, and has been operating continuously ever since. It has two 30-ton units, or a rated capacity of 60 tons in 24 hours, but as at present operated it is consuming an average of 60 tons in 16 hours of each day, 50 per cent more than the rated capacity. No fuel is used, yet all kinds of garbage, manure, and rubbish are consumed without difficulty. By the addition of another unit, of 50 tons capacity, the operating expense could be reduced, possibly, by 30 per cent and much of the wear and tear of present machinery from overwork would be prevented.

The improvements in stables and garbage incineration have practically eliminated all the principal fly-breeding areas in Colon and for the past 3 months the city has been remarkably free from flies.

Several improvements were made in the Colon municipal market during the year. A new roof with skylights was placed on the building, the wooden vegetable counters were replaced with concrete slabs and the meat stalls were inclosed by wire netting.

Infant mortality.—The infant mortality rate during 1920 was 142.41 as compared with 155.29 for 1919. The rate continues to remain high, due principally to the economical status and marital conditions of the larger percentage of the population of the city. The fresh milk supply for Colon amounts to less than 40 gallons per day, which is absolutely inadequate. The erection of a modern sanitary plant for the reconstruction of powdered milk is very greatly needed in this city. However, it seems the Panamanian authorities do not think so, for they have absolutely refused to allow the installation of such a plant in the city of Colon.

Street cleaning.—Most of the streets in Colon are in a very bad condition from lack of repairs. The concreting of these streets is a much-needed improvement and would greatly facilitate cleaning. It is recommended that a modern street-sweeping machine be purchased for the purpose of sweeping all paved streets in Colon and Cristobal. This would expedite the work and reduce the force necessary to keep streets clean.

Fines imposed for violation of sanitary regulations during the calendar year numbered 453, amounting to $984.

Antirat work, such as rat-proofing of buildings, elevation of bulky material and foodstuffs from the floor or the ground, thorough collection and disposal of garbage every 24 hours, and poisoning and

ıpping for the purpose of detecting any rodents that might be ıgue-infected, was carried on during the entire year. Barium ·bonate mixed thoroughly with the other ingredients of bakers' ıad and same baked into the ordinary loaf was found to be the ıst satisfactory method of using this poison.

This office found it necessary to employ a force of laborers to concrete repair work for private parties in Colon. We collected 443.55 for such work during 1920.

Veterinary work:

rantine inspections:		
Cattle		29,159
Hogs		10,876
e and post mortem inspection:		
Cattle		30,771
Hogs		10,731
demnations:		
Carcasses, cattle		35
Parts, cattle		1,350
Colon	150	
Cristobal	1,200	
Carcasses, hogs		516
Colon	162	
Cristobal	354	
Hogs passed for sterilization		141

A charge for inspection of 25 cents for cattle and 10 cents for hogs r head is made against the Colon abattoir. The collections for this rk since this charge was authorized (August 10, 1920) amounted $982.05.

Food inspection.—During the past 2 months one sanitary inspector s assigned to food inspection only. The results have been very ıtifying as shown by the improvement in the general cleanliness d sanitary condition of bakeries, dairies, ice cream parlors, restauıts, hotels, messes, etc. The following establishments are now ·eiving regular and systematic inspection by the food inspector: hotels, 37 restaurants, 3 messes, 18 bakeries, 5 bottling works, 8 ırkets, 48 vendors, 14 ice cream parlors and soft drink stands, 6 iries.

Mount Hope district.—As conditions warrant, antimalarial work Mount Hope district has been gradually extended; 30,242 linear rds of open drains were installed during the year. The installation very narrow drains in low swampy areas is being tried out exten·ely in this district and they have proved very satisfactory.

The antimalarial work in the district has been effective this year, is shown by the low malarial rate compared to former years. is contemplated to install an extensive system of tile drains roughout the district during the next dry season in order to reduce e cost of maintenance of open drains.

DIVISION OF QUARANTINE.

urgeon S. B. GRUBBS, U. S. P. H. S., Chief Quarantine Officer, January 1, 1920, to October 27, 1920.)

urgeon W. C. RUCKER, U. S. P. H. S., Chief Quarantine Officer, October 28, 1920, to December 31, 1920.)

It has been the constant aim of the Chief Quarantine Officer to minister the quarantine regulations with the minimum inter-

ference with commerce and to reduce restrictions and delay of shipping to the lowest point compatible with reasonable safety to the health of the Republic of Panama and the Panama Canal, the personnel of vessels touching at Canal ports and of the countries to which they are destined. Communicable disease may be brought here from the entire globe, and without proper sanitary supervision, the Isthmus is capable of becoming a focus for the redistribution of disease to many far distant points; the prevention of this by maritime quarantine is a problem resolving itself into:

(*a*) Securing accurate first-hand knowledge of the sanitary condition of ports dangerous to the Panama Canal.

(*b*) Stimulating the owners and operators of ships to prevent the ingress of infected persons, animals, and things to their vessels.

(*c*) The routine inspection of vessels and their personnel at ports of arrival in the Canal Zone, the isolation of infected or potentially infected persons, the fumigation of infected ships, and the periodic fumigation of vessels for the destruction of rodent and insect carriers of disease.

In the application of these sanitary safeguards it has been constantly borne in mind that it is the living disease vector which is most to be feared and it is this danger, rather than the inanimate disease carrier, which accordingly has been stressed.

In mid 1919, Doctor Grubbs, then Chief Quarantine Officer, was detailed to make a tour of inspection of the west coast of Central America. The ports visited were Punta Arenas, Costa Rica; San Juan del Sur and Corinto, Nicaragua; Amapala, La Union, and Acajutla, Salvador; and San Jose de Guatemala. Also the interior cities of Grenada, Managua, and Leon in Nicaragua were visited.

The objects of this trip were (1) to gain first-hand information of conditions, (2) to establish personal relations in order to obtain information by more direct means, (3) to stimulate preventive measures, especially regarding yellow fever, and (4) to modify our procedure at Balboa to correspond with actual conditions and necessities.

All these objects have been accomplished in a very satisfactory manner. If the Canal authorities can stimulate neighboring countries to prevent such diseases as yellow fever and plague, they will be protecting themselves and will facilitate commerce to the benefit of the Canal and the world as a whole. Not only has a warning against plague been sounded but arrangements have been made, or are pending, that will do a great deal to prevent the recurrence of yellow fever in the future. In Corinto a permanent sanitary inspector will devote his entire time to *stegomyia* elimination. As long as this work is continued yellow fever will spread to a very limited extent, if at all, in Corinto.

As to changes in quarantine procedure: (1) *La Union.*—We formerly required vessels to leave the wharf at 5 p. m., otherwise they would be fumigated on arrival at Balboa. This restriction has been removed because there is no mosquito breeding on the wharf; if there were, it is doubtful if they could get aboard a vessel. The removal of this restriction is of more advantage to shipping than is at first apparent as, on account of a strong cross current, it is possible to dock only on a slack tide and a vessel moving out to anchor at night may not be able to get to the dock until noon the next day.

2. *Corinto.*—Vessels were required to anchor in the stream at night, and the fumigation of vessels before sailing has been required since last August. Both these restrictions have been removed for the same reasons that apply at La Union. Inspection of all of Corinto for mosquito breeding has been in progress for some time. (3). *Punta Arenas.*—Formerly our restrictions required that passengers who had stopped over night be quarantined; those who had been in the port during daylight only were not held. This restriction has now been removed for two reasons (1) Punta Arenas has had no yellow fever for several years nor have there been any known cases in Costa Rica and the mosquito conditions are not bad; (2) passengers can leave Punta Arenas for Cristobal via Limon against which no quarantine is maintained, and if connections are good arrive in 2 days and are not delayed.

Experiences during the past month have strengthened the belief that such inspection trips are of the greatest value and should become a fixed policy of the quarantine service. We must help our neighbors to keep free of quarantinable disease, and in our quarantine we have a means of bringing this about for their own and our good, for the ultimate aim of quarantine should be the abolition of disease and not walling ourselves in against outside dangers we take no steps to abolish.

A similar tour of inspection was made of the western ports of South America. The following quotations from Doctor Grubbs' report indicate the results accomplished:

Observations are attached hereto in the form of notes on the ports visited. In addition, a trip was made to Quito to express to the President of Ecuador and other officials the interest and appreciation felt for the radical manner in which yellow fever has been eliminated from Guayaquil, to assure them that we are ready to promptly recognize such work by modifying our quarantine procedure and to suggest that similar steps be taken against bubonic plague.

At Lima a similar call was made, at the suggestion of the American Ambassador, upon the President, to express our interest in the extensive sanitary campaign he has inaugurated in Peru and especially in the efficient work now being done in the province of Piura.

As there is no yellow fever at Guayaquil, and the city is probably noninfectable at present, it is evident that the quarantine against persons from that port should be entirely removed so long as such conditions are maintained. This action will be the strongest possible incentive to have the present conditions maintained. As the minor ports of Ecuador were always infected from Guayaquil, their quarantine should similarly be lifted. The fumigation of all freight from Paita should be stopped as it is now arranged to have all lighters at that port fumigated whenever used for loading our ships, and for the fumigation of all dried hides, which are the only freight that may carry rats. As Paita is free from yellow fever and from stegomyia it will be proper to allow the quarantine officers, in their discretion, to count such time as may have been spent in Paita or Talara as against the quarantine period of passengers.

All Ecuadorian ports have doubtless had yellow fever from time to time, but probably have none now. The infection undoubtedly has come in the past from Guayaquil, as quarantine has been enforced rigidly against foreign ports, but rarely against those of Ecuador. There is no quarantine physician except at Manta and here quarantine was in force against Paita and Buenaventura and enforced by keeping all vessels that had touched at these ports, no matter how many days before, in quarantine with all hands until 6 days from arrival had elapsed.

Guayaquil is a city of 94,000 inhabitants on the Guayas River. Site is for the most part flat and during the torrential rains that fall in the wet season (December to March) is partly under water. During the dry season of 8 months there is practically no rainfall and the city is dry except for some brackish marshes on the outskirts. Guayaquil was destroyed by fire in 1896 and when rebuilt was laid out with wide regular streets. Active work is now going on to put down concrete and asphalt paving. Unfortunately this is being done in places before sewers are put in. The houses are mostly wood, or wood frames with stucco covering. In the poorer

parts they are of wooden frames with flattened bamboo sheathing. A few rat-proof concrete buildings are being constructed, but as cement costs 18 sucres ($8.80) a barrel these are the exception.

Yellow fever has been endemic in Guayaquil for years and persisted in spite of several attempts at its suppression until the campaign instituted by the International Health Board. This was begun in November, 1918, and was successful, the last case being reported in June, 1919. Guayaquil is not only free from yellow fever now but is undoubtedly noninfectable.

Antistegomyia work has been done in a less intense form in the small towns near Guayaquil, especially along the Guayaquil and Quito Railroad from Duran (across the river from Guayaquil) to Huirara.

Bubonic plague is prevalent among the rats at Guayaquil. The last human case was reported last April.[4] Considerable work is being done, probably as much as is possible under the circumstances, but this is directed as much against human cases as to the elimination of the disease among rats.

The U. S. Public Health Service has for years maintained an officer at Guayaquil. Since the resignation of the last regular officer, an Ecuadorian graduate of an American medical college has been on duty. He issues the U. S. bill of health on board just before each vessel sails for a United States port. Before doing so he inspects the officers, crew, and passengers and fumigates (Clayton apparatus) the holds that have received freight, and the crew's quarters.

Paita, Peru: This is northernmost port of Peru touched by regular lines; 2,700 inhabitants. The bay is a mere indentation but is protected by a point so that it is almost always calm. Weather is moderate and bright. It practically never rains. Paita is the outlet for the important valleys of the Piura and Chira rivers. Its exports are almost entirely cotton, with some dry hides. Paita and the surrounding towns have had two severe outbreaks of yellow fever and plague within the past year. Yellow fever has almost disappeared following an antistegomyia campaign which is still in force. Plague is also improved but this is due more to the natural extinction of rats by the disease than to any human efforts. Extensive plans have been completed for the rebuilding of a sanitary and rat-proof Paita to follow the burning of the present town which is made largely of cane and mud, but delays have continued.

No yellow fever has appeared south of the Province of Piura for many years but the entire coast may be considered plague-infected.[5] The ports down to Callao are all open, usually quite rough, dry, and barren. Vessels all lie out one mile and load by means of open lighters.

Callao (population 50,000) is the chief seaport of Peru and the port for the capital, Lima, 8 miles inland, with its suburbs is said to have 400,000 inhabitants. Yellow fever has not been reported in these cities for several years although there are many stegomyia, especially in summer. Our chief consideration is for plague, which is endemic. The health authorities are absolutely indifferent to this disease, make no efforts to catch rats or to change the form of construction even in new buildings. Callao is 4 days from Balboa by direct steamer."

The following memorandum was issued by the Chief Quarantine Officer, August 26, 1920:

"Memorandum for the Quarantine Officers, Cristobal and Balboa:

"The 6-day detention period for passengers in good health from Guayaquil and other Equadorian ports, is no longer required.

"The Province of Piura, Peru, is under yellow fever quarantine, but the ports of Paita and Talara may be considered entirely safe from yellow fever in computing the 6-day quarantine period. You are authorized to take into account the time that passengers arriving at Balboa have spent in the city of Paita, or in Talara, or the oil field adjacent thereto. The above must be considered as a distinct concession and passengers must be prepared to present evidence that will satisfy you that they have complied with this requirement, or they must remain at the quarantine station to complete the 6-day period.

The object of this arrangement is to relieve those places where efficient anti-mosquito work is being maintained from quarantine restrictions, at the same time keeping such restrictions upon interior points where this work has not sufficiently advanced." [5]

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[4] In the last 5 months of 1920, 92 cases of human plague were reported from Guayaquil. (U. S. P. H. S. Reports.)

[5] Since January 1, 1921, an extensive prevalence of yellow fever has been reported in the Department of Lambayeque, south of the Province of Piura, probably existing for some time previously. At present a 6-day quarantine is enforced at Balboa against all ports north of Callao.

The Quarantine Officer of Cristobal was detailed to make an inspection of Buenaventura and Tumaco, Colombia, with a view to recommending what quarantine restrictions should be enforced against these ports. The following excerpts from that officer's report are self-explanatory:

Buenaventura: The rainfall is about 400 inches annually and is well distributed throughout the year. The tide enters the lower levels of the town, and with the rainfall, is an important factor in keeping the town in a habitable condition. I slept on shore but did not encounter any mosquitoes. The water containers are well screened. This is the port for Cali, Manizales, and other places. In my opinion, there has been no yellow fever here since 1915 and then the infection was probably introduced from Guayaquil.

It is recommended:

1. That the quarantine be lifted, provided that within 3 months an active anti-mosquito campaign be underway.
2. That the Colombian Government finance this campaign and that the sanitary officers of the government direct the work.
3. It is suggested that in carrying out the work, the sanitary officer secure the cooperation and assistance of Mr. Walsh, the American Consul.
4. That our attitude at the end of 3 months depend on the manner in which the above recommendations are carried out, as shown by reports from Mr. Walsh, and their compliance with suggestions offered by him.

Tumaco: This town is 537 miles from Balboa and is situated in the southwestern corner of Colombia. It has a population of 6,000 and is located on an island which is about 5 feet above sea level. The soil is sandy and no water remains after the rains, except that collected in screened tanks and barrels. The sanitary conditions are the best I have seen in any of the smaller towns of Latin America. There is no trace of quarantinable disease having occurred here for at least 15 years. It is earnestly recommended that the quarantine be lifted at once.

Following the receipt of this report the following instructions were issued:

To the Quarantine Officers, Cristobal and Balboa:

1. The 6-day detention period for passengers in good health from Tumaco is no longer required.
2. The 6-day detention period for passengers in good health from Buenaventura is provisionally lifted.

During the year the general quarantine instructions have been entirely revised and amendments relative to night quarantine service have been promulgated. On February 5, 1920, the quarantine regulations were extended to include influenza and similar diseases as maritime quarantinable diseases.

The following instructions relative to vaccination have been ollowed throughout the year:

To Quarantine Officers: In order to facilitate travel and to avoid unnecessary vaccination of passengers who are amply protected against smallpox, quarantine officers are authorized to issue a certificate of vaccination which will be good for 5 years after they have vaccinated an individual and have personally observed either (1) successful vaccination, (2) vaccinoid, or (3) immune reaction.

The following technique must be strictly followed: The part to be vaccinated (preferably deltoid insertion) should be washed with soap and water, if necessary, and in any case with alcohol. After vaccination it is advisable to expose the arm to the open air for 15 minutes before the clothing is allowed to touch it. No shield or other dressing should be applied.

Vaccinate by one of the following methods:

1. Linear incision or abrasion. Use a sterile needle and with a single downward stroke for each make three scratches, each ½-inch long, parallel to each other and to the humerus, and 1 inch apart. Rub vaccine into two of these scratches, using a sterile toothpick, or other instrument. The third scratch will be used for a control.
2. Drill method. A sterile drill or dental chisel, about 2 millimeters wide may be used. With a twisting motion and moderately firm pressure make three small circular abrasions, 1 inch apart, two above and one below. Rub the virus into two of these abrasions, leaving the third for control.

Direct patient to return for observation on the second and fifth day. When time is limited, 24 hours may be sufficient to observe reaction of immunity and when this is established certificate may be issued. After observation of the fifth day in those not previously vaccinated, it may be necessary to have them return on the seventh and later days.

The following reactions only are recognized:

1. *Successful vaccination.*—In previously unvaccinated persons or in those whose immunity has completely disappeared, there should be present on the fifth day a vesicle, linear or circular, surrounded by a narrow areola, which progresses to a typical take on about the tenth day.

2. *Vaccinoid.*—In those whose relative immunity is somewhat low, this milder form of vaccination exhibits itself on the fifth day as a smaller vesicle with a larger areola. The duration of the reaction is shorter and less severe.

3. *Immune reaction.*—Where the immunity of the individual is high, either from a previous vaccination or from an attack of smallpox, a subsequent attempt at vaccination results in a prompt, sharp reaction which reaches its maximum in about 48 hours and may entirely disappear within 4 days. At the site of the inoculation there is a small reddened papule, linear or circular, surrounded by a very narrow areola. Itching is prominent.

Either of the foregoing reactions builds up or indicates immunity and warrants issuing a certificate good for 5 years. If none of these reactions occurs the result should be considered a failure and no certificate issued. Complete absence of reaction means inert virus or faulty technique.

The above instructions do not prevent issuing of temporary certificates immediately after vaccinating to those who must leave at once, but these should not be given where a failure is observed unless applicant is revaccinated.

THE ECONOMICS OF MARITIME QUARANTINE.

Surgeon Grubbs made a study of the economics of maritime quarantine not only from the viewpoint of the indirect effect which the Canal quarantine exercises upon the health and therefore upon the commercial prosperity of ports from which shipping passes to the Canal, but also from the aspect of the actual saving which accrues directly to ships through the reduction of detentions to the lowest margin of safety. It is manifestly impracticable to arrive at an absolutely accurate figure which will represent the average ton-detention-day loss of a ship in detention or an average passenger-detention-day loss for persons held in quarantine. The figure of 50 cents per ton-day for the former and $5 per passenger-day loss were therefore arbitrarily assumed. For all practical purposes these figures are accurate enough and by applying them it becomes possible to estimate and compare the results obtained from year to year. Thus in 1918, there were 151,176 ton-detention-days and 38,169 passenger-detention-days with a total direct loss of $267,935. In 1919 the loss was $173,538 and in 1920 it was $191,226. These figures show decreasing loss but unless the ratio of the loss to the total tonnage received is given the picture is not complete. In 1918 this loss was $23.15 per thousand ton received; in 1919 it was $12.02; and in 1920 it was $8.64.

This is set forth in the following table:

Year.	Total tons received.	Total ton-detention-days.	Total passenger-detention days.	Total loss.	Loss per 1,000 tons received.
1918	11,572,473	154,176	38,169	$267,935	$23.15
1919	14,512,721	161,376	18,570	173,538	12.02
1920	22,128,254	48,172	33,436	191,266	8.64

QUARANTINE TRANSACTIONS AT COLON AND CRISTOBAL DURING THE CALENDAR YEAR 1920.

Vessels inspected and passed	2,339
Vessels detained in quarantine	5
Vessels given provisional pratique	19
Total	2,363
Number of days vessels were held in quarantine	6
Supplementary inspections of vessels	1,575
Vessels fumigated:	
For mosquitoes, SO_2	18
For mosquitoes, Na Cn	7
For mosquitoes, SO_2 and Na Cn	6
For rats, SO_2	49
For rats, Na Cn	2
For rats, SO_2 and Na Cn	25
Total	107
Crew inspected on arrival	118,136
Passengers inspected on arrival	43,657
Crew passed on certificate of medical officer	43,618
Passengers passed on certificate of medical officer	10,814
Total	216,225
Supplementary inspections of persons on detained vessels	4,612
Persons detained in quarantine station	1,725
Number of days held	3,452

Immigration.—The inspection of immigrants has continued as in previous years.

ANCON HOSPITAL.

(Col. L. T. HESS, U. S. Army, Superintendent.)

Buildings and grounds.—A 2-story addition was built to the power-plant building; on the ground floor is the new carpenter shop, twice as large as the former one, and on the second floor are the electrical shop and miscellaneous stores of the electrician, carpenter, painter, and plumber. Following the change, the hospital bakery was transferred from the kitchen-mess hall building into the portion of the power-plant building formerly used as plumbing and carpenter shops, and the former bakeshop was occupied by the general mechanic as workshop and storeroom.

A storage and receiving room for the undertaker's department was built as an addition to the Board of Health Laboratory.

All chronic patients having been transferred to Corozal Hospital for the crippled and insane, the old frame building formerly occupied by these chronic cases was turned over to the Supply Department, razed, and reerected on one of their plantations.

The old morgue and the old carpenter shop were evacuated and turned over to the Supply Department.

Considerable work has been done toward improving the grounds by grading, sodding, planting of trees, etc. One hundred orange

trees, 50 grape fruit, and 25 avocado (alligator pear) trees have been set out. From trees already bearing on the hospital grounds the following amounts of fruits were gathered for use by the hospital:

Bananas (stalks)	290	Papayas	285
Bread fruits	687	Mangoes	7,841
Avocados	1,089	Guavas	2,385
Limes	18,658	Coconuts	234
Oranges	285	Sour sap	15

The hospital recommenced bakery operations in December. Thirteen thousand one hundred and twelve pounds of bread were made from 9,429 pounds of flour, the net cost per pound of bread being $0.0654.

Motor transportation.—All cars were kept in good state of repair; all mechanical repairs, except emergency road repairs, are now made in the motor car house instead of in the hospital garage, by the employees of the motor car inspection department instead of by the local hospital chauffeur-foreman. This has resulted in increasing the operating cost of our transportation, without increasing the efficiency of the service in any respect. Certain of the transportation is requiring considerable repairs and will probably have to be replaced before long.

Operating expenses.	Cost of equipment.	Net running expenses.		Mileage.	
		1920.	1919.	1920.	1919.
Truck No. 282	$844.59	$1,170.56	$1,090.67	6,700	7,591
Truck No. 1209	833.21	1,199.80	617.02	7,258	3,452
Hearse No. 305	1,412.74	707.33	580.09	1,248	1,605
Ambulance No. 301	632.50	1,320.42	1,347.05	6,917	7,597
Ambulance No. 303	604.02	2,021.02	182.88	7,834	770
Ambulance No. 307	658.41	.....	1,048.76	.....	5,405
Ambulance No. 308	762.30	1,975.33	1,649.94	8,935	8,035
Total	$5,747.77	$8,394.46	$6,516.36	38,892	34,445

Surgical clinic.—During the year 1,655 major operations and 5,781 minor operations were performed. Two thousand eight hundred forty-three cases visited the out-patient department, for whom 408 prescriptions were written. Two hundred eighty-nine obstetrical cases were delivered.

Medical clinic.—There were 2,738 cases treated in the out-patient department, for whom 1,650 prescriptions were written.

Eye and ear clinic.—Cases visiting the out-patient department numbered 7,542 for whom 2,650 prescriptions were written. One thousand fifty-two refractions were made and 1,215 operations performed.

X-ray clinic.—There were 2,608 cases handled; 5,324 plates; 364 X-ray films; 1,533 dental films taken; 50 treatments given.

Steward's department.—During the year 155,831 rations were issued to Ancon Hospital patients and 90,767 rations issued to personnel entitled to subsistence, a total of 246,598 rations; the net cost was $114,189.55.

There were 36,897 rations issued to pay boarders, mostly nurses who are charged $20 per month; the payments for these amounted to $18,744.65.

REPORT OF PATIENTS DAYS.

1920	296,946
1919	312,737
1918	319,908
1917	311,451
1916	270,294
1915	268,945
1914	338,901

COST OF SUBSISTENCE PER PATIENT PER DAY (ANCON HOSPITAL ONLY).

1920	$0.463
1919	.3495
1918	.315
1917	.3369
1916	.2522
1915	.2372
1914	.253

MOVEMENTS OF PATIENTS, NONRESIDENTS OF CANAL ZONE.

	Total number treated.			Died.			Days treated.		
	Ancon Hospital.	Corosal Hospital.	Total.	Ancon Hospital.	Corosal Hospital.	Total.	Ancon Hospital.	Corosal Hospital.	Total.
1917	274	76	350	7	3	10	5,101	21,396	26,497
1918	510	76	586	9	10	19	7,667	20,431	28,089
1919	883	56	939	19	3	22	15,434	17,245	31,779
1920	1,250	54	1,304	16	1	17	24,418	15,979	40,397

	1920.	1919.	1918.	1917.	1916.
Chronic patients:					
Total number treated	33	34	38	63	52
Total number of days treatment	9,626	9,710	8,603	9,836	9,174
Average number of patients per day	26	27	26	27	25
Average per capita cost	$0.315	$0.2654	$0.2602	$0.2520	$0.2400
Movement of military patients:					
Total number of admissions	860	1,392	4,165	2,469	1,037
Total number of days relief	15,134	22,217	49,067	33,494	28,519
Average number constantly sick	41.35	60.90	134.49	91.76	78.13
Admissions:					
To Ancon Hospital	9,783	10,503	12,153	10,880	9,116
To Corosal Hospital	170	151	229	191	225
To chronic ward	7	8	13	45	26
To cripple farm	12	17	39	54	59
Totals	9,972	10,679	12,436	11,170	9,426
Deaths:					
Ancon Hospital	276	343	336	368	325
Corosal Hospital	32	43	73	30	57
Operations:					
Major surgical operations	1,655	1,688	1,784	1,684	1,465
Minor surgical operations	5,781	5,813	4,424	1,775	1,333
Eye and ear operations	1,215	1,044	1,088	855	622
Refractions	1,052	1,263	1,312	1,108	1,378
Obstetrical cases delivered	289	314	321	301	246
Out-patient department:					
Total visits	13,123	13,833	14,276	11,784	13,188
Prescriptions written	4,708	5,424	4,230	3,798	6,289
Dispensary (district physician), Ancon:					
Total treated	105,171	102,034	92,201	142,290	130,219

FINANCIAL STATEMENT.

	1920.	1919.
Operating expenses	$705,836.14	$592,456 78
Revenues	438,582.01	322,222.37
Gross cost per patient per day (Ancon Hospital only)	3.82799	3.06188
Net cost per patient per day (Ancon Hospital only)	1.57536	1.65223
Operating expenses, Ancon Hospital	592,691.54	492,366 09
Revenue, Ancon Hospital	348,776.06	228,367.77
Operating expenses, Corozal Hospital	94,164.03	80,870 96
Revenue, Corozal Hospital	88,927.95	89,330 60
Operating expenses, dispensary	18,264.89	13,168 59
Revenue, dispensary	643.25	528 00

A more detailed statement of operations, etc., will be found in the statistical tables at the end of this report.

Among the recommendations of the Superintendent of Ancon Hospital, to cover more or less pressing needs of the institution, are the following:

1. Nearly all new hospital construction in the United States provides for hydro- and electro-therapeutic apparatus, the need for which in the tropics is greater than in the temperate zone. Residence in the tropics induces nervous conditions which are amenable to hydro- and electro-therapeusis and the establishment of such a service in Ancon Hospital is recommended. Room therefor could be provided with small expense, in the basement of Administration-Clinics Building, the equipment being the main item of expense.

2. The organization of a urological-skin service, now under the surgical service, will enable the hospital to care more satisfactorily for venereal and skin cases, which are not now, owing to the lack of a physician particularly qualified in genito-urinary work, receiving the attention they should. This proposed service can be taken care of on the third floor of the Administration-Clinics building, or in the proposed out-patient clinics building recommended below.

3. An "out-patient clinics" building, of reinforced concrete in harmony with design of present hospital structures, on the site near the dispensary is recommended for the purpose of housing the medical, surgical, and genito-urinary out-clinics and pharmacy. The present location of those clinics in the Administration-Clinics building renders them very inconvenient of access to out-patients visiting them.

4. With completion of permanent hospital buildings, steps should be taken to provide permanent quarters for hospital staff and gold employees in accordance with proposed plans. At least two of these quarters buildings should be constructed each year until completion of proposed layout.

5. A recreation hall, consisting of two large open pavilions of reinforced concrete in keeping with design of other hospital buildings, located on the hillside, is desirable for the use of convalescent patients. Such a building should be provided with covered passageways from the other sections of the hospital. The hillside should be terraced and set out in tropical plants and trees (mostly fruit

trees) and improved by walks, etc., to provide a suitable place for exercise of convalescent patients, especially those having tuberculosis, for whom no suitable means of out-door exercise is now provided.

6. Provision should be made for a sanitorium at some suitable place within the Canal Zone for the treatment of tuberculosis, with a view to segregating this class of patients. Under present conditions, these cases are sent into Ancon Hospital, for segregation in the isolation section, which is not well adapted nor of sufficient size for their accommodation.

7. Two large tennis courts and a swimming pool should be constructed for the use of gold personnel in close proximity to the nurses' quarters. Some form of exercise is absolutely necessary in this climate to maintain hospital employees in the state of physical fitness demanded by their duties.

8. The nurses' quarters at the present time do not provide sufficient quarters for the nursing staff; it has been necessary to double up in a few rooms, and for others to be quartered elsewhere. The nurses' home provides quarters for only 70 nurses, while 78 are on duty. Such congestion is not conducive to the best interests of the service, and provision should be made so that each nurse will have a room.

9. *Extension—Section B.*—Build an addition (basement and two stories) to rear of service section. This addition is needed so that the private rooms in a portion of this section will have an outside corridor similar to that of the other private rooms. At present these rooms are not desirable for use of private patients on account of the sun shining directly into the rooms during the days when it shines and during inclement weather the windows have to be kept closed, which renders the rooms stuffy, and is a source of constant complaint from private pay patients. Also, such an addition would give more room for the diet kitchen which at present is entirely too small for proper and efficient service of patients' diets. Further, it would afford more commodious reception rooms on first and second floors for use of visitors and incoming and outgoing patients, and in the basement provide a checking room for proper care of patients' clothing and baggage.

10. *Animal house.*—There should be built, in the rear of the laboratory a separate, suitable building for an animal house. At present such animals as are used for experimental and diagnostic work at the Board of Health Laboratory are kept in rooms which are dark, and although kept as clean as possible, the odor therefrom is very objectional and permeates not only through the laboratory building itself, but also to the street. People walking the road in front of the laboratory get the odor and a great many inquiries are made as to whether the odors are due to decomposing bodies in the laboratory. Aside from these facts, in the present location the animal rooms are not a suitable place to keep animals in a healthy condition. They should be kept in a separate building, especially designed to give them sunlight, plenty of ventilation, etc., and also to reduce to a minimum an insanitary nuisance.

11. Because of the difficulty in getting hot dry steam to all parts of the hospital and laboratory, due mainly to improper location of the steam plant, it is recommended the power plant be relocated

near the road back of the Board of Health Laboratory, about the present site of the attendants' quarters, and that a laundry be built in connection with the power plant, of sufficient capacity to handle the hospital linen. While the immediate expense may be considerable, with such a plant installed it would mean an immense saving to the hospital over the present arrangement.

12. Considerable equipment requires replacements and additional items are needed; the most important ones are, beds, cribs, mattresses, pillows, blankets, desks and office equipment for clinic offices, file cases for file room, china and silverware for private rooms and white sections, bakeshop and kitchen equipment, to include ice cream freezer and apparatus for ice manufacture, a pipe-cutting machine, a new ambulance and a new body for hearse (the present body is practically rotted out and will not last very much longer).

COROZAL HOSPITAL.

(Dr. LOUIS WENDER, Superintendent.)

Corozal Hospital, for the insane, is located at Corozal, 3 miles from Panama. The hospital wards occupy an area of about 5 acres and include 10 ward buildings for the insane. The management of this hospital also includes that of the farm of 150 acres, 30 cultivated and 120 pasture, on which the hospital is located. This institution operates a piggery and a dairy, furnishing milk for hospitals, and some for the small children in the Canal Zone and for adults on physicians' prescriptions. In addition, a home for cripples injured in the service of The Panama Canal is provided and operated under the hospital management.

BUILDINGS.

There were no new buildings constructed at Corozal Hospital during this year, but a few alterations were made. The nurses' quarters were enlarged, making their rooms more spacious and adding two rooms, enabling us to accommodate our full organization of female nurses and stewardess.

Ward "F," which has been utilized for the past year as an occupational ward for the male and female patients, was enlarged to accommodate more patients. This alteration was made in November at a cost of $1,200, which will be reimbursed by the income from articles sold from the occupational ward; already $500 has been turned in to be credited to this construction.

The feeding platform for the piggery has been surrounded by a concrete wall in order to make it more sanitary and prevent food from slopping off the platform, thus preventing flies breeding. The platform has also been resurfaced, the work being done by the patients.

A refrigerating machine has been installed in the dairy.

The kitchen and the second story porches and roofs and part of the wards were painted during the year.

A new concrete coal bin has been built at the railroad station by the hospital help, to facilitate the handling of coal for the hospital and quarters.

HOSPITAL DEPARTMENT.

There were 384 patients the first day of the year; 170 were admitted, 32 died, and 145 were discharged or transferred, leaving 377 remaining at the end of the year. We have endeavored to deport all those who could be sent back to their homes; the total deportations for the year numbered 80 patients.

The occupational ward, which was established in the early part of 1919, has proven a great success. Nearly 40 patients are in this department making various articles, whereby they spend their time in a congenial manner which produces a beneficial effect upon their mental condition. Owing to the lack of accommodations, our occupational undertakings are scattered in various parts of the hospital grounds; however, we have succeeded in finding some sort of work to employ about 80 per cent of the female patients and 60 per cent of the males. An open, spacious, well-ventilated building where more patients could be brought during the day to be instructed, would increase the efficiency of the occupational therapy and benefit the patients to a greater extent. Over $4,660 worth of produce was taken from the patients' garden and utilized for their own mess. Undertakings of this character do not entail any expense to the Health Department and yet are a material benefit to the patients themselves.

Broom-making machinery arrived recently and steps have been taken whereby some of the insane patients, and some of the chronics who were transferred from Ancon Hospital, will be induced to make brooms. Several chronics have already taken up this kind of work and are earning a little money in order to enable them to purchase small luxuries and other articles.

The grounds in the hospital inclosure have been kept in order by patients detailed for that purpose.

FARM DEPARTMENT.

General.—The number of cripple employees has been reduced from 50 to 29, by obtaining employment more remunerative for them than their work on the farm warranted us in paying. This, with the reorganization of the farm, has reduced its running expense to a great extent.

Dairy.—Our herd consists at present of 59 Jersey and 16 Holstein cows, 2 Jersey bulls, 1 Holstein bull, and 25 calves. With the regular arrival of feed from the United States and the pastures being in fairly good condition, we have been able to keep our regular supply of milk up to a good standard. Of the 25 Holsteins, which were imported from the United States in December, 1919, and immunized here against tick fever, 6 died as a result of the inoculation and 3 from other causes. The remaining 16 are doing well and we are at present milking 7 of them.

With the installation of the refrigerator, whereby the milk can be cooled by mechanical refrigeration, we are able to save on labor and ice approximately $75 per month. Not only has this proven a success financially, but from a sanitary viewpoint, as the exposure and handling of the milk is reduced by one-third. We continue to pasteurize our milk after each milking as previously.

Piggery.—There was a total of 272 pigs on December 31, 1920. During the year we purchased barrows and 30 sows from the Supply Department. These sows were of native stock and in very poor condition, but after being fattened were bred and are raising quite a number of pigs. There was only one death among the young pigs from hog cholera, as all our pigs are immunized at regular intervals against this disease. We have endeavored to supply Ancon Hospital with all its pork, selling the surplus to the Cattle Industry.

Garden.—During the year a nursery was started in order to enable us to supply the Isthmus with various hedges and flowers. We have continued to raise vegetables, which are sold to the hospitals and the commissaries. The rose garden has been enlarged and we are able to supply the demands for roses from time to time.

General remarks.—The general health of the patients, cripples, and chronics remains good. With the continued increase in the number of female patients, steps will have to be taken to construct a small ward to accommodate about 25 or 30 patients, due consideration being given to separate rooms for private patients, white Americans, and others who are willing to pay the extra cost, there being at present no suitable accommodations for the latter class of patients.

COLON HOSPITAL.

(Maj. T. J. LEARY, U. S. Army, Superintendent.)

HOSPITAL WORK.

The work is going along nicely. Many demands are made that the ordinary hospital is not called upon to meet, due to the fact that this institution combines an emergency hospital with a busy dispensary service. In addition to this work, quite a few calls are made by our physicians into the town and to ships in the harbor.

BUILDINGS.

These are very satisfactory. The painting of the hospital was finished during December and it now presents a neat and pleasing appearance. Ward "A" of the old hospital group has been given a slight overhauling, and is in condition to care for isolation cases coming to us for overnight, to be transferred to Ancon Hospital the following day. The most urgent need of the hospital is an up-to-date X-ray equipment. The X-ray operator could replace one of our present force, and it would be of still greater advantage if he were competent to do gas-oxygen anesthesia and apparatus for gas-oxygen anesthesia were installed at the hospital. The addition of such equipment would be a great time and labor saver and would be more suitable for emergency work than ether anesthesia.

If any policy of expansion for Colon Hospital will be given consideration, it is believed the first addition to the present group should be a modern isolation wing. Colon will doubtless continue to grow rapidly in importance from year to year and in order to meet its growing requirements, the hospital facilities on this side should be expanded to the point of being able to hospitalize all of the sick from the Atlantic side. The principal objection to the present system is the separation of the sick from their families and friends.

SANTO TOMAS HOSPITAL (Panama).

(Maj. EDGAR A. BOCOCK, U. S. Army, Superintendent.)

While Santo Tomas Hospital is not entirely under the jurisdiction of The Panama Canal it is, more or less, intimately associated with the Health Department by virtue of the agreement between the Republic of Panama and The Panama Canal, dated October 17, 1905, which reads as follows:

"The affairs of Santo Tomas Hospital will be administered by a Board of Directors of five members, three of whom will be appointed by the President of the Republic of Panama and two by the Governor of the Canal Zone. Of the three directors appointed by the President, one shall be the Treasurer of the Hospital, and one the Secretary of the Board. The Chief Health Officer of the Canal Zone, thereupon, will be the President of the Board of Directors. The Superintendent, two internes, and three graduate nurses shall be appointed by the Governor of the Canal Zone and their salaries paid from the funds of the Canal Commission."

Under the provision of this agreement, Santo Tomas Hospital has continued to operate under the joint administration mentioned and under the direct supervision of the Chief Health Officer of The Panama Canal.

The year 1920 has been a particularly successful one for the hospital in many ways. The auditing and property accounting department, installed in 1919, has been perfected and enlarged with use, until it is now functioning efficiently and satisfactorily. All outstanding debts of the institution have been canceled and current monthly bills are now paid as soon as received. The revenues of the past year have amounted to $245,414.96, while the actual operating expenses have been $231,939.97, leaving a balance of $13,474.99 available for use. An excess of approximately $1,000 of revenues above expenses is now being shown monthly.

An effort has been made to improve the purchasing department of the hospital to the point where the best possible supplies and equipment can be obtained for the least expenditure of money. Waste and extravagance have been lessened and economy and thrift in every department advocated and enforced.

The buildings, many of which are very old and practically falling down, have been repaired, repainted, and rendered habitable until the construction of the new Santo Tomas Hospital shall be completed. The usual routine of repairs of furniture and equipment by hospital artisans has been accomplished. All new furniture, wooden legs, crutches, coffins, etc., are manufactured in the carpenter shops. All beds and tables have been reenameled and electric and plumbing fixtures installed and repaired. In fact, all maintenance and upkeep work has been done by the hospital personnel, thereby saving an enormous expense.

Professional service.—All attention possible has been devoted to improving the professional service of the hospital and while it is still far from being ideal, it is undoubtedly advancing in efficiency. During the year, 14,584 patients have been treated; 155,593 days,

relief have been furnished, an average of 422 patients per day during the entire year. The average length of stay in hospital, for each patient was 10 days. Eight hundred fourteen deaths occurred in the hospital.

During the year, 1,960 major operations and 2,721 minor operations were performed by the surgical service. Eight hundred seventy-seven obstetrical cases were delivered. In the dental clinic, 4,756 treatments were given and 1,384 teeth extracted.

There were 8,421 cases treated by the medical service in the hospital, and 8,840 patients treated in the dispensary; 12,489 prescriptions were filled in the pharmacy of the hospital. The ambulance service which operates under this department made 1,946 calls, and the dispensary vaccinated 17,270 persons against smallpox.

During the year, 5,121 cases were examined and treated in the eye and ear clinic; 456 operations were performed; 11 refractions were made and 1,221 prescriptions furnished to patients.

A total of 1,248 cases was handled in the X-ray clinic. Three thousand one hundred twenty-six plates and 522 dental films were used and 91 treatments administered.

Marked success has been attained by the venereal clinic. During the entire year, 2,512 new cases have been admitted, of which 1,825 were men and 687 women; 18,206 treatments and 1,548 consultations have been given; 1,682 injections of salvarsan, 2,120 injections of mercury and 598 operations have been done on clinic patients. The patients treated in this clinic have been relieved as follows: Six hundred twenty-seven cured, 374 discharged improved, 221 still under treatment, and the remainder left the clinic without authority from the doctor. Of the cases treated, 321 were diagnosed as syphilis and 746 as gonorrhea. Prophylactic treatment has been given to 3,046 men. Wassermann tests have been done on 4,187 persons and of this number 26.8 per cent have been positive. The revenue derived from the clinic amounted to about $8,000. A vigorous campaign of advertising throughout the entire city has been kept up and excellent results secured therefrom.

During the year, 251,593 rations were issued and prepared by the steward's department for the patients and personnel of the hospital. Of this number 96,000 were for the personnel and 155,593 for patients. The average cost of each ration per person per day was $0.317. The cost of hospitalization for each patient has amounted to $1.515 per day, including subsistence. The total cost of operating this department has been $90,764.83.

NEW HQSPITAL SANTO TOMAS.

The work of construction of the new Santo Tomas Hospital has been pushed energetically during the entire year of 1920. This enormous project was begun on November 15, 1919. All the grading and filling, consisting of approximately 92,000 cubic yards of earth and rock, has been completed and all municipal work, including streets, water and sewer lines, and electrical conduits have been installed. Materials in form of steel, lumber, and cement, have been acquired from the United States and placed on the hospital site. The plans of all of the buildings have been completed by the drafting department. Two

buildings, the isolation and tuberculosis sections, have been practically completed with the exception of the finishing work which will not be done until all the buildings are ready for completion.

LEPER ASYLUM, PALO SECO.

(Mr. F. D. TUCKER, Superintendent.)

During the year the asylum buildings were repainted, both exterior and interior, by the patients. Trees and hedges were set out, lawns marked out and graded, and gravel connecting walks put in. The task of altering the baths and toilets of the nine quarters buildings was completed; a ventilator was built on the office-commissary building; a vegetable storeroom and a carpenter shop was put in and the fronts of two quarters were changed, doing away with the long and dangerous front steps. A new panga was built. All repairs to buildings, furniture, plumbing, etc., were made by our own labor. Grass and bush cutting and sanitary work also were kept up.

One new building was completed by outside labor and occupied during the year, to be used as a detention ward for mental and unruly cases among the patients.

Weekly moving picture exhibitions were given as usual; several dances were held and entertainments were given by some local talent, others by Girl Scouts, the Penn State Quartette, etc. National holidays were celebrated, and, thanks to the great generosity of friends on the Isthmus and in the States, our Christmas was a real one, with a tree, ice cream, cake, turkey, and presents. A small organ given by States' friends contributed greatly to the success of these times.

During the year 11 patients were admitted, 5 died, 2 were repatriated, 1 mental case was transferred to Corozal Hospital, and 6 cases, after exhaustive examinations, were discharged. Patient population December 31, 1920, was 74.

A monthly average of 30 patients were employed, the payroll averaging $193.21 per month. The value of products purchased from the patients for the asylum for the year was $811.02. Total cash sales at the local store, operated by the asylum, amounted to $4,696.28.

The oral administration of chaulmoogra oil was continued this year with rather more willingness on the part of the patients, due to the fact that several cases were discharged in 1919 "apparently cured," or at least in whom there were no active lesions or bacteriological evidence of infection. A diagnostic board, consisting of the Chief of the Medical Clinic and the Chief of Laboratory of Ancon Hospital and the Assistant Chief Health Officer, which board passes on every case admitted to the asylum, met four times during the year to consider carefully those cases at the asylum whose improvement seemed to warrant their discharge. As a result of these examinations, six cases were discharged during 1920.

The Board of Health Laboratory is beginning to produce an ethyl ester of chaulmoogra oil; it is expected that in the near future there will be available for hypodermic use a sufficient amount of this derivative to enable the asylum to greatly obviate the discomfort that is caused by administration of the oil by mouth.

On December 31, of our 74 patients, 62 (83.7 per cent) were taking chaulmoogra oil by mouth. As inability to tolerate the oil is given as their objection by practically all those not accepting the treatment, it is hoped that by the improved method of administration soon to be followed it will be possible to induce every one to be treated.

BOARD OF HEALTH LABORATORY.

(Dr. L. B. BATES, Chief of Laboratory.)

(Operated in connection with Ancon Hospital.)

The work of the laboratory during the year has necessarily been largely routine. The following report has been prepared in the form of tables in so far as it was practicable to do so. The following paragraph is quoted from the rules of Ancon Hospital to show the amount and variety of work now required of the laboratory:

> "The Board of Health Laboratory is the official laboratory for Ancon Hospital, Colon Hospital, Corozal Hospital, the District Physicians, the Quarantine Stations, Palo Seco Leper Colony, Health Officers of Panama and Colon, the Coroner, the Veterinary Service of the Health Department, and the Colon Free Clinic for Venereal Diseases. It also serves as a Department Laboratory for the Panama Canal Department, U. S. Army, and for the Fifteenth Naval District, U. S. Navy, when so designated by those services."

In addition, considerable work has been done for other departments, private hospitals, and private physicians.

An epidemic of influenza started on the Canal Zone about the middle of March and commenced to wane in the middle of April. A bacteriological study of the cases was commenced early in the epidemic and the results reported before the Medical Association in May, at which time about 400 cases had been studied.[6] Nasopharyngeal cultures, sputum cultures, blood cultures and cultures from autopsy material were made whenever possible. Subsequent work has not changed the conclusions which were drawn at the time from the study of these cases. The conclusions drawn were as follows:

1. No one organism has been predominant in our cases. A variety of organisms has been recovered from lesions which were apparently the same, the appearance of the lesion being no criterion as to the organism present.

2. *Streptococcus hemolyticus* has been found in but small proportion of our cases and when found they were few in number and not widely distributed. We may safely say that the *Streptococcus hemolyticus* has played an unimportant part in this epidemic.

3. The influenza bacillus has been recovered from 15 per cent of the throats cultured during this epidemic; during an examination of 140

[6] The paper is entitled "The Bacteriology of the Influenza Epidemic on the Canal Zone during March and April, 1920," by Dr. Lewis B. Bates, and Dr. J. H. St. John, and is being published in the 1920 Proceedings of the Medical Association of the Isthmian Canal Zone.)

throats in this hospital made in February, 1919, this organism was not recovered. The increase in positive cases seems to be about equally divided between influenza and noninfluenza patients.

4. The pneumonias in our fatal influenza cases seem to have been caused by a variety of organisms. In no instance were the lungs sterile and in most cases some of the organisms found in the upper respiratory tract were also found in the consolidated lung tissue.

5. Although diffident about offering any opinion on account of the incompleteness of our work we quote the following paragraph of Cummings[7] as stating our views at present: "The whole clinical and pathological picture becomes intelligible if we can postulate a primary etiological agent acting locally upon the respiratory surfaces and generally through its toxic products in such a manner as to prepare the way for invasion by the prevailing respiratory flora."

During the year the pathologist reviewed sinusitis, otitis media and mastoiditis in the 3,376 autopsies which had been performed by him at this laboratory. Much valuable data is collected in this paper and the 1920 number of the Proceedings previously referred to will contain this article in full.

The entomologist prepared an article upon the Panama Canal species of the *Genus Anopheles*, bringing synonomy up to date, and treating particularly upon the taxonomy of the species and the collection and care of material for study. The article with 13 illustrations has been printed by the Health Department as a monograph, and will also appear in the Proceedings.

At various times throughout the year blood films showing malarial parasites, smears, cultures, intestinal parasites and ova and other laboratory specimens have been forwarded to medical schools requesting them.

BACTERIOLOGICAL REPORT.

Blood cultures:		
Total number of blood cultures		405
Positive blood cultures		73
Organisms recovered in blood cultures:		
B. typhosus (25 cases)		33
B. paratyphosus A		2
B. coli		2
Pneumococcus		15
Type I	3	
Type II	2	
Type III	4	
Type IV	6	
Streptococcus viridans		3
Streptococcus hemolyticus		6
Staphylococcus		12

Blood cultures made from 76 cases of influenza uncomplicated with pneumonia were all sterile; blood cultures made from 24 cases of influenza complicated with pneumonia were positive in 10 instances, the pneumococcus being recovered each time. (Type II, 2; Type III, 2; Type IV, 6.)

Blood cultures were not made routinely in cases of lobar pneumonia. Fifteen cases were cultured and the pneumococcus recovered 5 times. (Type I, 3; Type III, 2.)

[7] Studies of Influenza in Hospitals of the British Armies in France, 1918. Introduction by Col. S. L. Cummings, C. M. G., A. M. S.

Dark field.

Dark field examinations of skin lesions	10
Number positive for *Treponema pallidum*	1
Number positive for *Treponema pertenue*	5
Dark field examinations of venereal ulcers	142
Number positive for *Treponema pallidum*	25
Number positive for *Treponema perfringens*	2

Many of the ulcers were mere abrasions. Some were too old or had received enough treatment to render the finding of the *treponema pallidum* improbable. In typical cases of chancre two or more examinations were made when possible. Two of the positive cases included in the above had the positive lesion on parts other than the genital organs. The ulcer in one case was on the lip, in the other case on the umbilicus.

Sputums.

Sputums from various sources were cultured for *B. influenzae* and *Pneumococcus*, from August to December, inclusive, this work beginning three months after the subsidence of the influenza epidemic.

Number of sputums cultured	74
B. influenzae	9
Pneumococcus (Type I, 1; Type II, 6; Type III, 3; Type IV, 11)	21

Spinal Fluid Cultures.

Total number of cultures (52 cases)		123
Positive cultures (18 cases)		34
B. influenzae	1	
B. influenzae and *Staphylococcus albus*	1	
B. influenzae and *Streptococcus viridans*	1	
Meningococcus (type normal)	1	
Pneumococcus (Type I, 1; Type II, 1; Type IV, 2.)	4	
Staphylococcus aureus and *Pneumococcus* (type IV)	1	
Streptococcus viridans	2	
Streptococcus hemolyticus	1	
Staphyloccus aureus	4	
Streptococcus hemolyticus and *Staphylococcus aureus*	1	
B. tuberculosis	1	

Autogenous vaccines prepared	63
Stools cultured for typhoid-dysentery group	1,057
Urines cultured for typhoid group	551
Urines cultured for other organisms	303
Milks:	
Corozal Hospital dairy	243
Mindi dairy	211
Panama dairies (through Health Officer, Panama)	738
Commissaries	2
Condensed	11
Panama ice cream (through Health Officer, Panama)	11
Colon dairies (through Health Officer, Colon)	18
Colon ice cream (through Health Officer, Colon)	5
Commissary ice cream	2
Powdered milk	1
Miscellaneous	5
Naso-pharyngeal cultures	551
Sputum cultures	597
Throat cultures (Positive for *B. diphtheriae*, 66 cases, 190)	1,939
Throat cultures (other organisms than *B. diphtheriae*)	13
Plaques in buccal cavity	51
Membrane from throat	1
Ear cultures	81
Eye cultures	17
Ear casts	17

Mastoid cultures	4
Pus from chest	2
Pus from abscess	1
Pleural fluid cultures	13
Acitic fluid cultures	3
Fluid from knee joint	3
Fluid from gall bladder	2
Gland cultures	9
Conjunctival cultures	2
Phenol coefficient test of salvarsan and neosalvarsan	2
Phenol coefficient test of hycol	1
Autopsies cultured (heart's blood, organs, exudates, etc, 537)	184
Source not given	1
Vaccination scab	1
Root of tooth	1
Maxillary sinus	1
Throat smears	95
Sputums examined for *B. tuberculosis*	143
Urines examined for *B. tuberculosis*	6
Vaginal smears	150
Urethral smears	103
Conjunctival smears	122
Skin lesions	3
Lesion on forearm	1
Dermatitis of fingers	1
Blood for embryo of filaria hominis	1
Coagulation time of blood	1
Test of typhoid vaccine	1
Examination of tropical ulcer	1
Can of oysters	1
Can of asparagus tips	1
Water cultures	3
Flour cultures	5
Meat from sandwich	1
Fish for culture and bacteriological count	1

Bacteriological report (animals).

Cattle ears (195 positive for *B. anthracis*)	317
Hide cultured for *B. anthracis*	2
Horse ears	3
Hog ears	1
Rat glands	4
Gland culture	1
Culture from cow	1
Blood cultures	33
Autopsies cultured	89
Horse's hoof cultured	1
Urine cultured	1
Stool cultured	3
Skin scrapings from horse	1

Bacillus typhosus was recovered in blood culture from 25 individuals; 12 of these cases were from shipboard and 13 from the Canal Zone or the Republic of Panama. The two cases from which *Bacillus paratyphosus A.* were recovered were from shipboard; the two ships coming from Chile and Peru, respectively.

Typhoid carriers.—On December 31, 1919, two typhoid carriers, were under sanitary surveillance. One of these, a white American woman, has since returned to her home in the United States. The other, a colored laborer, is still a carrier and is still paroled under sanitary surveillance. Two additional carriers were detected during the year; one was a white American soldier who has since been transferred to the Walter Reed General Hospital, the other a colored woman who was and still is an inmate of the Corozal Hospital for the Insane.

Survey for meningococcus carriers.—A case of *Meningococcus meningitis* developed in Co. B, M. P., Fort de Lesseps, C. Z., October 8, 1920, a survey for the detection of carriers was undertaken.

Number swabbed	67
Number positive	7

Types of Meningococcus recovered.—Normal, 3; intermediate, 3; para, 1. Subsequent swabbing of these patients proved them to be but temporary carriers of the *Meningococcus*. The meningitis patient referred to above became a chronic carrier of the meningococcus and at this date is still held in isolation.

Leprosy.

Number of examinations made for leprosy	76
Number positive for *B. leprae* (new cases)	18

(In addition, three old cases reexamined were positive.)

Photographs are now taken at the laboratory of all cases of leprosy as soon as a diagnosis is made. These are taken for purposes of record, also for purposes of comparison at a later date to show results obtained after a course of chaulmoogra esters or other treatment.

Anaerobic bacilli.—Anærobic bacilli of the gas gangrene group were recovered from two cases of human gas gangrene.

During the year 13,566 Wassermann tests were performed on 9,234 persons. The results of these tests are summarized in the following tables:

WASSERMANN REACTIONS DURING THE YEAR 1920.

(*Based on the number of individuals examined and not on the number of tests made.*)

	Positive.	Negative.	Total.	Per cent positive.
White, civil:				
Males	209	1,919	2,128	9.82
Females	13	204	217	5.99
White, soldiers, males	108	1,150	1,258	8.58
Total	330	3,273	3,603	9.15
Spanish and white natives:				
Males	117	607	724	16.16
Females	24	194	218	11.00
Total	141	801	942	14.19
Blacks and mulattoes:				
Males	770	2,458	3,228	23.85
Females	334	1,106	1,440	23.19
Total	1,104	3,564	4,668	23.65
Chinese, males and females	7	14	21	33.33
Grand total	1,582	7,652	9,234	17.13

In addition Wassermann tests were made on 358 spinal fluids from as many individuals, and of these, 72, or 20.11 per cent, were positive.

PATHOLOGICAL.

During the year 334 autopsies were performed at the Board of Health Laboratory. The causes of death were as follows:

General diseases.

Malarial fever, estivoautumnal	2
Scarlet fever	1
Influenza	32
Dysentery, entamebic	1
Dysentery, bacillary	4
Leprosy	2
Hemoglobinuric fever, unqualified	1
Pyemia	2
Septicemia	3
Pyemia and septicemia, pneumonococcus	1
Tetanus	2
Pellagra	2
Tuberculosis of the lungs	17
Acute miliary tuberculosis	9
Tuberculous meningitis	2
Abdominal tuberculosis	1
Pott's disease	2
Tuberculosis of bones and joints	1
Disseminated tuberculosis	23
Syphilis, tertiary	2
Syphilis, cerebrospinal	3
Syphilis, hereditary	2
Cancer of the stomach and liver (esophagus)	1
Cancer of the breast	1
Cancer of other organs	4
Anemia, secondary, cause not determined	1
Purpura hemorrhagica	1
Total	123

Diseases of the nervous system and of the organs of the special senses.

Encephalitis	2
Simple meningitis	4
Pneumonococcus meningitis	4
Myelitis	1
Cerebral hemorrhage, apoplexy	6
Softening of the brain	2
General paralysis of the insane	8
Dementia precox	1
Disease of the ears	2
Total	30

Diseases of the circulatory system.

Pericarditis	1
Malignant endocarditis	4
Organic disease of the heart	10
Angina pectoris	1
Aneurysm	1
Arteriosclerosis	2
Embolism and thrombosis	1
Phlebitis	1
Total	21

Diseases of the respiratory system.

Broncho-pneumonia	3
Lobar pneumonia	11
Gangrene of the lungs	1
Total	15

Diseases of the digestive system.

Follicular tonsillitis	1
Acute appendicitis	2
Intestinal obstruction	3
Duodenal ulcer	1
Cirrhosis of the liver	1
Biliary calculi	1
Total	9

Nonvenereal diseases of the genito-urinary system and annexa.

Chronic nephritis	11
Pyo-nephritis and pyelitis	3
Hypertrophy of the prostate gland	1
Salpingo-oophoritis	1
Total	16

The puerperal state.

Accidents of pregnancy	1
Puerperal albuminuria and convulsions	1
Total	2

Diseases of the skin and cellular tissue.

Phlegmon and cellulitis	2

Diseases of the bones of the organs of locomotion.

Diseases of the bones and joints (tuberculosis excepted)	2

Malformations.

Congenital malformations (stillbirth not included)	10

Diseases of early infancy.

Premature birth	4
Malnutrition	25
Other diseases peculiar to early infancy	7
Total	36

Affections produced by external causes.

Suicide by firearms	1
Acute poisonings (food excepted)	3
Burns (conflagration excepted)	1
Accidental drowning	1
Traumatism by a fall	4
Traumatism by machines	2
Traumatism by railroad crushing	3
Traumatism by other crushings	5
Lightning	1
Electricity (lightning excepted)	1
Homicide by firearms	1
Homicide by cutting instrument	1
Homicide by other means	1
Other forms of external violence	1
Legal execution by hanging	3
Total	29

Ill-defined diseases.

Ill-defined organic disease	2
Infection of undetermined origin	1
Total	3

Stillbirths and nonviable fetus.

Stillbirths (at or near full term)	23
Nonviable fetus	13
Total	36
Grand total	334

The most frequent causes of death listed for the year were:

	Cases.	Per cent.
Tuberculosis	55	16.4
Influenza	32	9.5
External affections (trauma)	29	8.6
Malnutrition	25	7.4
Diseases of the heart	16	4.7
Acute respiratory diseases	15	4.4
Nephritis, chronic	11	3.2
Congenital malformations	10	2.9

Table showing the more common causes of death at autopsy in the Board of Health Laboratory.

Date.	Number of autopsies per year.	Pneumonia.	Tuberculosis.	Hemoglobinuric fever, malaria.	Affections produced by external causes.	Chronic nephritis.	Combined types of dysentery.	Organic heart disease.	Typhoid.	Diarrhea and enteritis (in children).	Cancer.
1904	6	1	1	.....	.....	.....	.....	.....	.....	.....	.....
1905	269	60	9	27	3	8	5	3	9	.....	2
1906	509	191	22	50	24	23	39	15	33	.....	2
1907	496	156	35	27	40	27	36	12	58	4	4
1908	361	59	63	46	26	25	23	11	14	.....	7
1909	295	55	37	26	32	31	11	17	11	1	5
1910	451	50	91	52	30	37	36	16	10	6	4
1911	508	83	102	41	38	36	19	20	9	11	11
1912	425	53	79	23	37	27	15	22	6	7	11
1913	460	47	89	21	34	26	8	26	5	23	12
1914	375	36	78	6	38	12	6	27	5	14	3
1915	328	28	56	14	20	12	5	14	2	15	10
1916	323	25	81	8	17	20	7	10	6	9	7
1917	330	24	51	5	21	23	3	18	1	3	5
1918	253	38	68	6	6	12	.....	8	.....	1	5
1919	324	22	55	3	15	14	3	20	3	10	11
1920	334	[1] 46	55	.....	29	11	5	16	.....	.....	6
Total	6,047	974	972	355	410	344	221	255	172	104	105

[1] This includes 32 cases of influenza.

Table showing number of autopsies performed revealing the following diseases per year.

Date.	Autopsies performed per year.	Yellow fever.	Beriberi.	Ankylostomiasis.	Tetanus.	Infectious diseases of children.	Plagues.	Smallpox.
1904	6	....	....	....	....	....	....	....
1905	269	12	7	7	2	....	1	....
1906	509	1	5	4	....	....	....	....
1907	496	....	1	2	1	....	....	....
1908	361	....	1	2	3	....	....	....
1909	295	2	....	....	....	....	1	....
1910	451	2	....	....	....	....	....	....
1911	508	....	1	1	1	....	1	....
1912	425	1	....	....	1	4	....	....
1913	460	....	....	2	3	1	....	....
1914	375	....	1	....	4	2	....	....
1915	328	3	1	....	2	1	....	....
1916	323	....	2	....	....	3	....	1
1917	330	....	7	....	1	2	....	....
1918	253	....	....	2	....	3	....	....
1919	324	2	....	....	....	3	....	....
1920	334	....	....	....	....	*1	....	....
Total	6,047	23	26	20	18	20	3	1

* Scarlet fever.

Four hundred seventy-three bodies passed through the laboratory during the year 1920; of these 9 had been autopsied at Colon Hospital, of the remaining 464, 334, or 71.9 per cent, were autopsied at this laboratory, 28.1 per cent were not autopsied.

MALARIAL CARRIERS FOUND AT AUTOPSY (EXCLUDING 2 CASES DYING OF MALARIA).

	Cases.		Cases.
January	4	August	3
February	1	September	2
March	3	October	2
April	3	November	5
May	1	December	3
June	6		
July	2	Total	35

Three hundred thirty-four autopsies minus 2 deaths from malaria show 35 out of 332 autopsies revealing pigment and parasites in scant manner in rib marrow and spleen films or a per cent of 10.5.

Their local residences were as follows:

Colon	14	Balboa	1
Gatun	1	Panama City (suburbs)	4
Chagres River village	1	Cattle Industry pastures	6
Culebra	1	Peruvian sailor	1
Corozal	3	Fort Clayton	1

Microscopic examinations and reports on surgical specimens.

Tonsils (pairs)	262
Tonsils (pairs) and adenoids	172
Adenoids	34
Specimens from eyes and eyelids	22
Specimens from nose (nares)	98
Specimens from nose (cutaneous)	9
Specimens from external auditory canals	19
Specimens from skin of face (nose excepted)	15
Specimens from oral cavity (tonsils and adenoids excepted)	10
Specimens from skin of back	5
Specimens from skin of buttocks	2
Specimens from skin of external genitalia	11
Specimens from perineum and anus	6
Specimens from skin of upper extremities	13
Specimens from skin of lower extremities	7
Specimens from skin of chest and abdomen	3
Appendix	174
Specimens from intestines	6
Specimens from rectum	14
Specimens from stomach	2
Specimens from larynx and trachea	2
Carotid body	1
Thyroid gland	13
Specimen from brain	1
Salivary glands	2
Uterus and appendages	51
Cervix uteri	11
Tubes and ovaries	42
Specimens passed from or taken from uterine cavity	18
Spermatic cord	2
Epididymis	4
Testes	5
Kidneys	2
Bladder, specimens from	2
Prostate glands	4
Mammary glands	12
Gall bladder	7
Omentum, specimens from	3
Muscles, specimens from	3
Tendons, specimens from	1
Amputated lower extremities	4
Amputated upper extremities	1
Nerve, ulnar	1
Joints, specimens from	2
Bones, specimens from	3
Artery, aneurysm of	1
Lymph nodes, cervical	16
Lymph nodes, supraclavicular	1
Lymph nodes, submaxillary	1
Lymph nodes, axillary	4
Lymph nodes, epitrochlear	3
Lymph nodes, inguinal and femoral	7
Lymph nodes, retroperitoneal	1
Lymph nodes, meso-appendiceal	1
Lymph nodes, location unknown	1
Colon Hospital autopsy sets of tissues	43
Total	1,169

PRINCIPAL LESIONS ENCOUNTERED IN SURGICAL SPECIMENS OTHER THAN INFLAMMATORY.

Malignant tumors (repeated specimens same case excluded).

Uterus	5
Breast	5
Nose	6
Rectum	8

Malignant tumors—Continued.

Bladder and prostate	2
Lower lip	3
The nares	2
Scalp and cheek	1
Face	2
Stomach	1
Penis	1
Larynx	1
Eyelids	1
Floors of mouth and tongue	1
Scrotum and perineum	1
Vagina and inguinal glands	1
Back of hand	1
Omentum (primary growth unknown)	1
Tube and ovary	1
Leg	1
Ovary	1
Lower maxilla	1
Carotid body with metastases	1
Total	44

Benign tumors.

Fibro-adenoma of breast	4
Intracanalicular adeno-fibroma of breast	3
Mixed tumor of parotid gland	4
Psammoma of the brain	1
Osteo-chondroma of a rib	1
Lipoma of the back	1
Epulis, upper jaw	1
Fibro-myomato-uteri	22
Dermoid cyst of the ovary	3
Cystadenoma of the ovary	1
Simple cysts of the ovary	11
Cystic thyroid glands	2
Exophthalmic goiter	1
Hemangioma of the lip	1
Fibro-hemangioma of the chest	1
Sublingual cyst	1
Fibromata of the skin	4
Sebaceous cysts in wall of abdomen	1
Sebaceous cysts of face	1
Rectal polyp	1
Nasal polyp	12
Polyp of the endometrium	2
Pigmented papilloma of the back	1
Papilloma of the face	3
Papilloma of the hand	2
Papilloma of the tonsils	2
Papilloma of the lip	1
Papilloma of the tongue	1
Papilloma of the external auditory canal	1
Total	93

Specimens showing tubercu'osis.

Epididymis	3
Testicle	1
Bladder and prostate	1
Sinus in perineum	1
Sinus in scrotum	1
Fallopian tube	2
Abscess of the buttock	1
Abscess of thigh	1

Specimens showing tuberculosis—Continued.

Appendix	5
Omentum	1
Tongue (ulcer at root)	1
Tendon sheath	1
Skin of the neck	1
Tonsils (pairs) and adenoids	3
Adenoid	1
Lymph nodes, cervical	10
Lymph nodes, supraclavicular	1
Lymph nodes, axillary	2
Lymph nodes, epitrochlear	2
Lymph nodes, unknown location	1
Total	40

Other infrequent lesions encountered:

Leprosy		7
Sole of foot	1	
Palm ulcer	1	
Ulnar nerve	1	
Skin nodule	1	
Foot and leg amputated	1	
Nasal septum	1	
Pterygium	1	
Otomycosis (casts from external auditory canal)		17
Dermatomycosis		2
Mycosis of an inguinal lymph node		1
Hodgkin's disease		2
Filariasis of epididymis and lymph node		1
Filariasis of an inguinal lymph node		1
Gas gangrene, amputated leg		1
Ainhum		1
Jigger infestation sole of foot		1
Gauze sponge encapsulated in pelvis 14 years		1
Umbilical chancre		1
Intussusception		1
Congenital cyst of the trachea		1
Congenital cystic kidney		1
Ectopic pregnancy (two at full term in broad ligament and tube)		6
Duodenal ulcers		2
Appendices filled with oxyuris vermicularis parasites		5
Total		52

A review of the meningitis autopsy records during the years 1907 to 1920, inclusive was made and the following table was compiled. Bacteriological examinations were conducted at autopsy. Agglutination of the recovered organisms was carried out but no typing done.

Pneumococcus meningitis (This excludes pneumococcus meningitis which occurred as a lesion in pneumococcus septicemia or pyemia.)	66
Simple meningitis (*streptococcus, staphylococcus*, etc.) (This also excludes septicemia and pyemia of these natures associated with meningitis.)	56
Tuberculous meningitis (This excludes cases of disseminated tuberculosis in which the meninges revealed a lesion.)	30
Cerebrospinal fever (epidemic form) (This excludes one case which died long after an attack of meningitis in which the only lesions found were meningococcic arthritis—shoulder and hip abscesses.)	11
Influenzal meningitis	3

The following table shows how scattered in time these cases appeared:

Autopsy No.	Date admitted.	Race.	Age.	Local residence.
			Years	
1295	December 25, 1907	Martinique negro	22	Gatun, C. Z.
1804	September 10, 1909	Martinique negro	25	Gatun, C. Z.
1815	September 20, 1909	Colombian negro	30	Gatun, C. Z.
3760	December 15, 1913	Jamaican	11	Panama City.
3766	December 23, 1913	Mexican	24	S. S. *City of Para*, Balboa Harbor
3919	April 10, 1914	Jamaican	26	Paraiso, C. Z.
4941	May 22, 1917	American	.....	S. S. *Huntington*, Balboa Harbor.
5052	August 31, 1917	West Indian negro	1½	Panama City.
5244	May 28, 1918	Japanese	.....	S. S. *Anyo Maru*, Balboa Harbor.
5377	November 25, 1918	West Indian negro	27	Panama City.
5446	February 20, 1919	West Indian negro	30	Panama City.

Animals (wild and domestic), autopsies:

Cattle	25
Calves	18
Hogs	11
Horses	5
Dogs	23
Goats	2
Cat	1
Chickens	3
Guinea pigs	34
Rabbits	7
Deer	15
Monkeys	2
Iguana	1
Porcupine	1
Pigeon	1
Saura (native opossum)	1
Fish	1
Total	161

Animals (wild and domestic), examination:

Tissue specimens from cattle	7
Tissue specimens from hogs	4
Tissue specimens from dogs	3
Blood films from cattle	649
Blood films from deer	87
Blood films from dog	41
Blood films from iguana	8
Blood films from horse	6
Blood films from porcupine	1
Hemoglobin tests on cattle	49
Hemoglobin tests on dogs	26
Brain films from cattle	33
Dog stools	43
Dog urine	5
Total	920

The principal diseases encountered that were important among domestic animals were as follows:

Anthrax (cattle).
Piroplasmosis (cattle, horse, dog, deer.)
Hog cholera.
Tuberculosis (dairy cattle and hogs).
Umbilical infections (calves).
Myiasis (screw-worm infections of hide sores and umbilicus).
Poisoning by cattle dip contaminations.
Oesophagostomiasis nodularis (goats).
Uncinariasis (chiefly dogs and young calves).
Bacillus paratyphosus B. (Guinea pigs).
Gas bacillus septicemia (three hogs).
Actinomycosis (one calf).

Rats and mice examined		17,080
Mus musculus	10,326	
Mus alexandrinus	725	
Mus norvegicus	2,508	
Mus rattus	3,521	

Animal experimentation.

Biting experiments with the deer and cattle ticks. Both types developed on either animal as a host. Deer piroplasmosis was given to a calf and cattle piroplasmosis was given a fawn raised in captivity. In each case the infections were light as shown by blood film examinations. Work is to be continued.

General miscellaneous examinations, human:

Films taken from the maternal surface of placentae (8 were positive for malaria, 2.8 per cent)	284
Blood films examined for malaria	922
Stools	3
Urine	3
Films from ulcer on wrist (Oriental sore)	1
Films from nasal passages	1
Films from ulcer in palate of mouth	1
Cigarette tobacco molds	1
External descriptions of bodies not autopsied	5
Feces examined for parasites and ova	101

Microscopic slides prepared:

Surgical preparations	6,140
Autopsy preparations	4,404
Animal tissue preparations	1,608
Total	12,152
Paraffin preparations	12,034
Frozen preparations	118
Total	12,152

CHEMICAL DEPARTMENT.

Arsenical cattle dip	9
Acetone	2
Alcohol	1
Alkaloids, for identification	3
Anthrax serum, phenol content	1

CHEMICAL DEPARTMENT—continued.

Beverages:		
For preservatives		1
For alcohol content		14
For denaturants		5
Cotton		1
Bloods examined		176
Nonprotein nitrogen	140	
Urea nitrogen	156	
Urea	156	
Uric acid	142	
Creatinin	142	
Glucose	134	
Cholesterin	11	
Carbon dioxide	6	
Calcium	1	
Bread		3
Bullet		1
Butter		5
Cream		1
Crude carbolic acid		4
Calibration of clinical thermometers		1,000
Cocoa, powdered glass		1
Clay		2
Clay, for arsenic		1
Caterpillars, for arsenic		3
Coconut meal		3
Calf meal		2
Cigarettes		1
Cognac		1
Drug, narcotics		1
Eggs		1
Fluid, for arsenic		1
Feed, for arsenic		1
Flour		5
Hide, for arsenic		9
Hide scrapings, for arsenic		1
Gastric analyses		31
Gasoline		6
Hydrogen, peroxide		1
Hominy, lye		1
Iron ore		1
Ice cream		27
Kerosene		1
Lard substitute		1
Matches, safety		21
Milks, dairy, food value		184
Milks, dairy, for preservatives		3
Milks, condensed		7
Milks, evaporated		2
Milks, mothers'		25
Milks, powdered		1
Mahogany filler		1
Mineral		1
Oil, Diesel		2
Oil, castor		1
Oil, fuel		2
Opium, for identification		3
Oleomargarine		24
Oysters, canned, lot		1
Oysters, fresh, lot		1
Potatoes		1
Powder, vegetable		1
Rice		3
Rosin		1
Spinal fluids, for arsenic		5
Spinal fluids:		
Colloidal gold	394	
Butyric acid	388	
Ammonium sulphate	388	
Phenol	388	

CHEMICAL DEPARTMENT—Continued.

Stomach of cow, arsenic		1
Stomach contents of horse, phenols		1
Silk		1
Sugar, percentage of sucrose		9
Sugar cane		1
Soil, for arsenic		2
Toxicological examinations		7
Umber		1
Urine examinations		106
Routine	64	
Arsenic	1	
Urea	4	
Urea nitrogen	5	
Acetone bodies	11	
Glucose	21	
Nitrogen partition	2	
Lead	11	
Mercury	1	
Calcium	1	
Renal function	3	
Urine, bovine, for arsenic		4
Vinegar		1
Vomitus		1
Water, complete analysis		1
Water, for arsenic		3
Washings from milk bottle		1

The work of the chemical laboratory during the year 1920 has consisted mostly of routine analytical work, which is given in the above tabulated form.

The working out of a method for the utilization of two shipments of crude carbolic acid received at the larvicide plant consumed considerable time. While conforming to specifications as to "tar acid" content and specific gravity, these two shipments differed from the crude carbolic acid received heretofore in some manner yet not thoroughly understood, and were not capable of being worked into a satisfactory larvacide by the method which has been in use at the larvicide plant for several years. In all our previous experience with the manufacture of larvicide no crude carbolic acid similar to these two shipments has been received, and no trouble has ever before been experienced in the manufacture of larvicide. After considerable experimental work in the laboratory it was found that sulfonation of the crude carbolic acid by treatment with concentrated sulphuric acid and heat would so alter its deportment in the usual process of manufacture as to produce a satisfactory larvicide. This method was tried at the larvicide plant on a larger scale and found to produce a good larvicide. The whole of the two shipments of crude carbolic acid were made into larvicide with this additional treatment. The following shipments of acid have been of the same grade as was received previous to the two unsatisfactory lots, so that it has not been necessary to use the sulfonation process recently.

An intensive study, from the laboratory standpoint, of the colloidal gold reaction with spinal fluids has been carried on during the greater portion of the year, with special attention to the preparation of the colloidal gold. This work will be carried on during the coming year, as in the past, in connection with the routine performance of the colloidal gold reaction.

The preparation of the ethyl esters of the fatty acids of chaulmoogra oil has been started and about 700 grams prepared to date.

Sufficient experimental work has been done to place the production of the esters on a safe working basis, and the preparation in sufficient quantities for use at the leper colony has been commenced.

PHOTOGRAPHY.

A considerable number of photographs were taken at the laboratory during the year. These represented a variety of medical, surgical, dermatological, pathological, and entomological subjects. A number of miscellaneous objects of a medico-legal character, or other material in cases where photographs were desired as part of a permanent record were photographed.

ENTOMOLOGICAL REPORT.

In the entomological department work was carried on in practically all branches of entomology throughout the year, and insects belonging to the various orders examined and classified. Investigations on various problems in connection with medical, agricultural, and general entomology were conducted.

The examination and classification of adult mosquitoes collected in habitations was continued throughout the year. A large percentage of the specimens received consisted of adults taken in the daily hand catches in married quarters, military posts, camps, etc., in the Zone. Camps outside the Zone, such as the U. S. Army camp at David, R. P., and field camps at other points, also sent in catches of adult mosquitoes for identification at frequent intervals. This was of considerable value in establishing an index to the various types present at the camps and in determining the prevalence of species concerned with the transmission of disease. Specimens collected on board ships, shortly after their arrival from ports where mosquito-borne diseases were potentially present, were also received from time to time.

A considerable number of lots of mosquito larvæ were received from various points in the Zone and the cities of Colon and Panama, for identification during the year. The value of this work in indicating the types and prevalence of mosquitoes breeding in the different areas is quite apparent. More especially is this important at points where no hand catches of adults are being made.

The following table shows the number of species of adult mosquitoes and larvae classified during the year:

	Adults.	Lots of larvae.
Culicini:		
Anopheles albimanus	6,023	22
Anopheles tarsimaculata	4,613	15
Anopheles pseudopunctipennis	469	8
Anopheles punctimacula	111	3
Anopheles apicimacula	31	6
Anopheles argyritarsis	4	5
Anopheles eiseni	2	3
Total number of anopheles	11,253	50

	Adults.	Lots of larvae.
Culicini—Continued:		
Aedes calopus	497	492
Aedes taeniorhynchus	2,330	10
Mansonia titillans	1,684	1
Mansonia nigricans	15	.....
Mansonia fascillatus	10	.....
Aedeomyia squamipennis	5	1
Culex quinquefasciatus	5,719	152
Culex coronator	4	34
Culex corniger	.....	20
Culex proximus	.....	6
Culex factor	.....	5
Culex equivocator	.....	5
Culex leprincei	.....	4
Culex elevator	.....	2
Culex jubilator	.....	2
Culex revelator	.....	2
Culex declarator	.....	1
Culex extricator	.....	1
Culex reflector	.....	1
Culex chrysonotum	.....	1
Culex spp	4,012	71
Psorophora lutzii	47	.....
Uranotaenia geometrica	.....	1
Haemogogus, lutzii, deinocerites, etc	81	4
Total culicini minus anopheles	14,404	817
Sabethini:		
Wyeomyia, etc	353	3
Total of mosquitos identified	26,010	879

During the period extending from March to December, inclusive, there were 1,274 separate lots of adult mosquitoes received for identification. No records were kept of the number of lots received during January and February.

Nearly all of the mosquito larvæ came from Panama City and Colon and when it is considered that practically each lot meant a breeding place it speaks very well for the vigilance of the Health Department of Panama and Colon in locating so large a number. It also indicates that, even after nearly 16 years of American sanitation, it is quite probable that a considerable amount of mosquito breeding would occur in the city if the American regulations were relaxed or the sanitary inspectors removed. The large percentage of larvæ as shown in the above table being those of the yellow fever mosquito, *Aedes calopus* Miegen, emphasizes the necessity for constant vigilance in controlling mosquito-breeding and the maintaining of close quarantine restrictions.

The entomologists made a number of inspection trips of various kinds to different points in the Zone throughout the year. Among these inspections were included: Juan Mina citrus grove to observe insects of economic importance; Farfan Camp to investigate mosquito-breeding; Corozal for examination of Larro cattle feed; Paraiso, Darien, and other points on the line to observe mosquito flights; Corozal Hospital to determine if fleas were infesting the wards, and many other investigations of various kinds.

Identifications were made of many ticks, fleas, lice, flies, fly larvæ causing myiasis in man and in animals, termites, beetles, scale insects, etc.

Life history and control studies were conducted on the papaya fruit fly, *toxotrypana curvicauda* Gerst, and the spiny citrus white fly, *Aleurocanthus woglumi* Ashby.

Reports were made on the control of the Banyan Thrips (Cuban Laural Thripes); the Fall Army worm; and various insects attacking trees and foliage in Ancon Hospital grounds.

A survey and identification of the fleas found infesting the different species of rats in the Canal Zone and Panama is being made.

Observations on certain phases of the bionomics of the yellow fever mosquito, *Aedes calopus* Miegen, are being conducted.

UNDERTAKING DEPARTMENT.

In October an addition of one room was built onto the laboratory. This room is approximately 14 by 24 feet and occupies the space between the main laboratory building and the crematory building. This room provides space for the sealing, crating, and temporary storing of embalmed bodies, free access to the refrigerator, and is also used as a general utility room by the undertaker.

Number of bodies received (5 disinterred)		473
Number of bodies embalmed	71	
Number of bodies cremated	168	
Number of bodies buried on Isthmus	252	
Number of bodies shipped	50	

ADMISSION RATE PER 1,000 EMPLOYEES.

Hospitals and Quarters.

all causes.

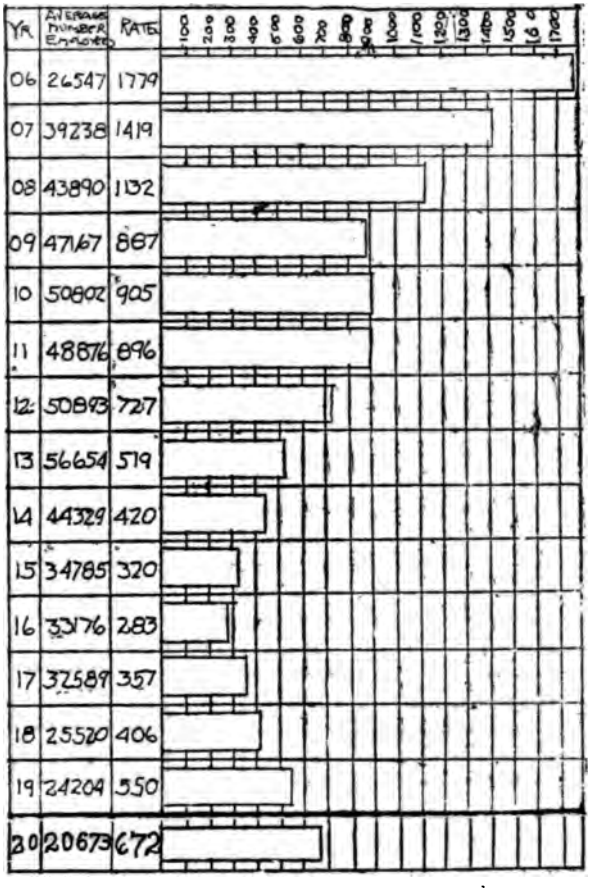


Chart No. 1.

DEATH RATE PER 1,000 EMPLOYEES.

ALL CAUSES.

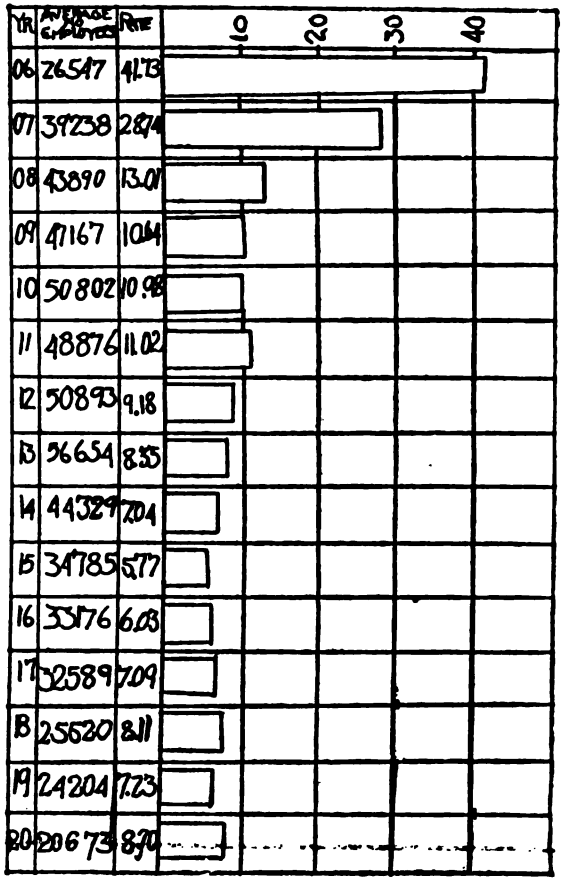


CHART NO. 2.

NONEFFECTIVE RATE PER 1,000 EMPLOYEES.

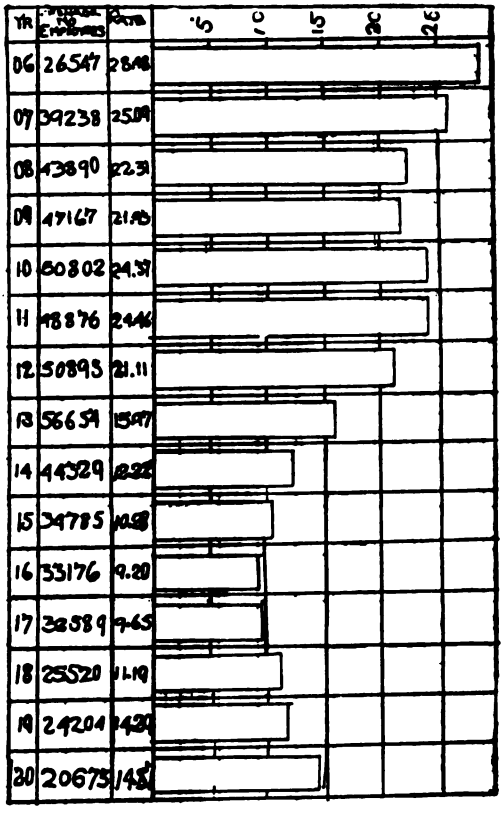


CHART NO. 3.

MALARIAL FEVER.

ADMISSION RATE PER 1,000 EMPLOYEES.

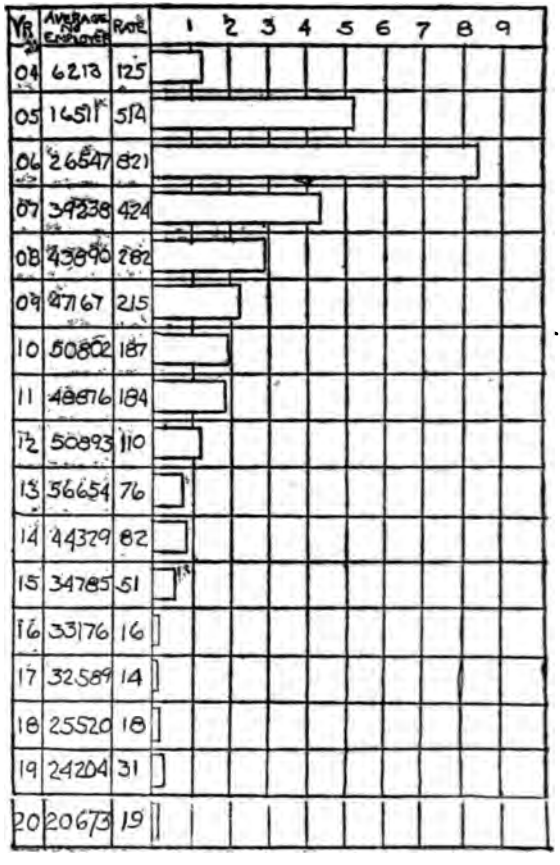


CHART NO. 4.

MALARIAL FEVER.

DEATH RATE PER 1,000 EMPLOYEES.

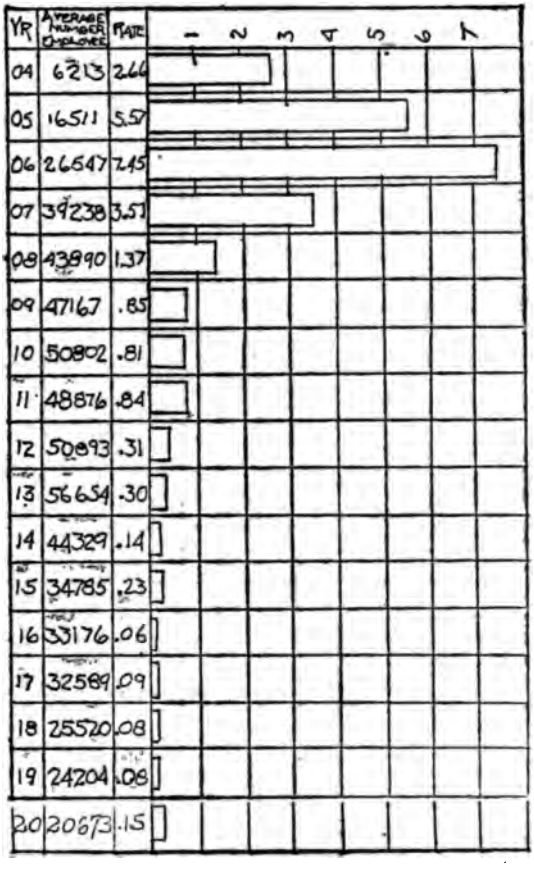


CHART NO. 5.

MALARIAL FEVER.

DEATH RATE PER 1,000 POPULATION IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

EMPLOYEES AND NONEMPLOYEES.

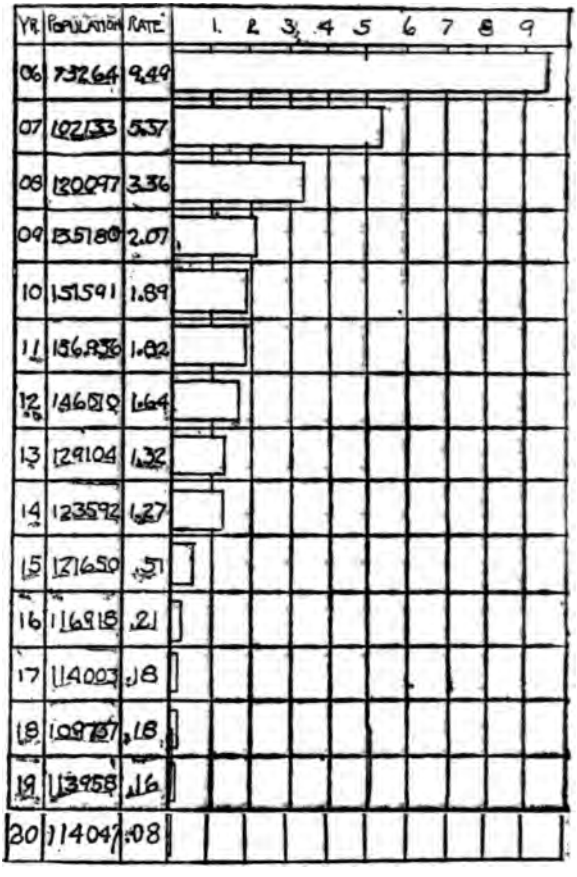


CHART NO. 6.

TABLE I.—DISCHARGES FROM HOSPITALS, DEATHS, AND NONEFFECTIVE RATES FOR EMPLOYEES.

ABSOLUTE NUMBERS.

	Average number of employees.	Discharges from hospitals and deaths.			Deaths.			Noneffective from sickness.	
		Total.	Diseases.	External causes.	Total.	Diseases.	External causes.	Days treated.	Constantly noneffective.
Year, 1920:									
White	4,688	1,393	1,252	141	22	17	5	31,775	86.81
Colored	15,985	3,183	2,550	633	158	136	22	80,760	220.65
Total	20,673	4,576	3,802	774	180	153	27	112,535	307.46
Year, 1919:									
White	4,523	1,271	1,141	130	10	8	2	27,338	74.90
Colored	19,681	3,834	3,121	713	165	142	23	98,891	270.93
Total	24,204	5,105	4,262	843	175	150	25	126,229	345.83

PROPORTIONATE NUMBERS.[a]

Year, 1920:								
White	4,688	297.14	267.06	30.08	4.69	3.63	1.06	18.52
Colored	15,985	199.12	159.53	39.59	9.88	8.51	1.37	13.80
Total	20,673	221.35	183.91	37.44	8.70	7.40	1.30	14.87
Year, 1919:								
White	4,523	281.01	252.27	28.79	2.21	1.77	0.44	16.55
Colored	19,681	194.81	158.58	36.23	8.38	7.21	1.17	13.77
Total	24,204	210.92	176.09	34.83	7.23	6.20	1.03	14.29

[a] Annual average per 1,000 employees.

TABLE II.—CAUSES OF DEATHS OF EMPLOYEES BY COLOR.

Cause of death.	Color.		Age (in years).					
	W.	B.	15–20	21–25	26–30	31–35	36–40	41–45
Typhoid fever		3	1					2
Malarial fever, estivoautumnal	3					1		1
Influenza	2	19	2	5	6	3	2	1
Dysentery, entamebic		1						
Tetanus		1						
Pellagra		1				1		
Tuberculosis of the lungs		19	1	3	1	9	2	3
Abdominal tuberculosis		1						1
Pott's disease		2			1	1		
Disseminated tuberculosis		8		1	2	1	4	
Syphilis, tertiary		4			1	1		
Cancer and other malignant tumors of the stomach and liver	1							
Cancer and other malignant tumors of the peritoneum, intestines, rectum	1							
Cancer and other malignant tumors of other organs and of organs not specified		2				1		1
Purpura hemorrhagica		1			1			
Encephalitis		2						1
Pneumococcus meningitis		2		1			1	
Cerebral hemorrhage, apoplexy	1	5						1
Softening of brain	1	1						
General paralysis of the insane		2				1	1	
Malignant endocarditis		1				1		
Organic diseases of the heart		11		1	2	2	2	2
Aneurysm		3					2	
Arteriosclerosis		2						
Embolism thrombosis	1							1
Acute bronchitis		1						
Broncho-pneumonia		11		3	4		2	
Pneumonia (unqualified)		2				1		1
Lobar pneumonia	1	8		2	2	2	1	1
Gangrene of the lungs		1		1				
Other diseases of the respiratory system		1						1
Ulcer of stomach		1			1			
Acute gastritis		1					1	
Acute appendicitis	1	1					1	
Inguinal hernia		2						1
Other hernias	1							
Intestinal obstruction		1		1				
Duodenal ulcer		1						
Cirrhosis of the liver	1				1			
Bright's disease	2	11			2	1	1	5
Salpingitis and other diseases of the female genital organs		1		1				
Phlegmon and cellulitis		1		1				
Diseases of the bones		1					1	
Suicide by firearms		1			1			
Acute poisonings		1				1		
Burns		1					1	
Accidental drowning	1	6	1	1	1	1	1	1
Traumatism by cutting or piercing instruments		1						1
Traumatism by fall	1	2						1
Traumatism by machines		1	1					
Traumatism by other crushings	2	3		1	1	1	1	1
Railroad traumatism		3				2		1
Electricity		1			1			
Homicide by cutting or piercing instruments	1	1				1	1	
Other external violence		1				1		
Cause of death not specified or ill-defined	1				1			
Total	22	158	6	22	29	33	25	28

AGE, AND LENGTH OF RESIDENCE ON ISTHMUS.

Age (in years)—Continued.					Length of residence on Isthmus (in years).														
46–50	51–55	56–65	66–75	76–85	–1	1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–10	10–15	15–25	25–40	Life.	Unknown.	Total.
...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	1	...	1	...	3
1	...	...	...	...	...	...	1	...	...	...	...	1	...	1	...	...	...	...	3
1	1	...	...	1	1	...	1	...	...	...	1	2	1	4	1	...	9	1	21
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1
1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
...	...	...	...	...	...	...	...	1	...	...	2	1	1	7	3	...	...	4	19
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	2
...	2	...	...	...	...	...	...	...	...	1	...	2	...	4	...	...	1	1	8
...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	4
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	2
...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2
3	1	1	...	...	...	...	...	...	...	1	...	1	1	1	1	...	2	...	2
...	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	6
...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	2	2
...	1	1	...	...	...	...	...	...	...	...	...	...	...	8	1	...	2	...	11
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	3
1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
...	1	1	...	...	...	...	...	...	...	1	1	...	...	2	1	...	4	2	11
...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	2
1	...	...	...	...	...	...	...	...	...	1	...	1	...	3	...	1	3	...	9
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2
...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	2
1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1
...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1
2	1	1	...	...	...	...	...	...	1	1	...	3	1	5	2	...	...	...	13
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
1	...	...	...	...	...	...	...	...	...	1	...	...	2	...	...	...	...	4	7
...	2	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	2	3
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	...	...	...	...	1	1	1	2	...	...	2	5
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	3
...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	1
...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1
13	11	10	2	1	2	1	3	1	1	8	6	15	11	54	21	3	25	29	180

TABLE III.—DEATHS OF RESIDENTS, AND DEATH RATES, OF THE CITIES OF PANAMA, COLON, AND THE CANAL ZONE.

Place.	Average population.	Deaths.			Annual rate per 1,000 population.		
		Total.	Disease.	External causes.	Total.	Disease.	External causes.
Year, 1920:							
Panama	60,500	1,297	1,246	51	21.44	20.60	0.84
Colon	26,078	554	517	37	21.24	19.82	1.42
Canal Zone	27,459	242	211	31	8.81	7.68	1.13
Total	114,037	2,093	1,974	119	18.35	17.31	1.04
Year, 1919:							
Panama	61,369	1,211	1,165	46	19.73	18.98	.75
Colon	26,078	573	536	37	21.97	20.55	1.41
Canal Zone	26,511	229	207	22	8.64	7.81	.83
Total	113,958	2,013	1,908	105	17.66	16.74	.92

TABLE IV.—DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1-4	5-10	11-20
General diseases.									
Typhoid fever	3	1	....	4	....	....	....	....	1
Paratyphoid fever	1	1	....	2	....	....	....	....	....
Malarial fever, estivoautumnal	7	2	6	3	....	....	2	2	....
Measles	....	1	....	1	....	1	....	....	....
Scarlet fever	....	1	....	1	....	....	1	....	....
Whooping cough	....	2	....	2	....	2	....	....	....
Diphtheria and croup	5	2	....	7	....	1	4	2	....
Influenza	39	23	10	52	....	6	5	1	5
Dysentery	1	....	....	1	....	....	....	....	....
Entamebic	4	....	1	3	....	....	1	....	....
Bacillary	4	....	....	4	....	3	1	....	....
Unclassified	....	1	....	1	....	....	1	....	....
Leprosy	4	2	1	5	....	....	....	....	1
Mumps	1	....	....	1	....	....	1	....	....
Hemoglobinuric fever, unqualified	....	1	....	1	....	....	....	....	....
Purulent infection and septicemia	3	2	....	4	1	....	....	....	....
Pyemia	1	1	1	1	....	1	....	1	....
Septicemia	5	4	2	7	....	....	2	....	1
Pyemia and septicemia, pneumococic	1	1	....	2	....	....	....	....	....
Tetanus	2	1	....	3	....	....	....	1	....
Pellagra	1	6	1	6	....	....	....	....	1
Beriberi	1	....	....	1	....	....	....	....	....
Tuberculosis of the lungs	140	122	21	232	9	5	6	3	23
Acute miliary tuberculosis	5	10	2	13	....	3	9	1	....
Tuberculous meningitis	4	5	3	5	1	1	6	1	1
Abdominal tuberculosis	3	....	....	3	....	....	1	1	....
Pott's disease	3	....	....	3	....	....	....	1	....
White swellings: Tuberculosis of bones and joints	1	....	....	1	....	....	....	....	1
Tuberculosis of other organs	1	....	....	1	....	....	....	....	....
Tuberculosis of the larynx	1	1	1	1	....	....	....	....	1
Tuberculosis of the lymph glands	1	....	....	1	....	....	....	....	1
Tuberculosis of the genito-urinary organs	2	1	....	3	....	....	....	....	....
Disseminated tuberculosis	29	14	....	42	1	3	7	3	4
Rickets	....	1	....	1	....	....	1	....	....
Syphilis, tertiary	10	4	....	14	....	....	....	....	1
Syphilis, hereditary	8	1	3	6	....	9	....	....	....
Syphilis, period not stated	3	1	....	3	1	....	....	....	....
Cancer and other malignant tumors of the buccal cavity	3	3	2	4	....	....	....	....	....
Cancer and other malignant tumors of the stomach, liver, esophagus, and pharynx	8	5	2	11	....	....	....	....	....
Cancer and other malignant tumors of the peritoneum, intestines, rectum	3	....	2	1	....	....	....	....	....
Cancer and other malignant tumors of the female genital organs	....	12	....	12	....	....	....	....	2
Cancer and other malignant tumors of the breast	....	1	....	1	....	....	....	....	....
Cancer and other malignant tumors of the skin	1	....	1	....	....	....	....	....	....
Cancer and other malignant tumors of other organs and of organs not specified	16	5	4	16	1	....	....	....	1

CITIES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND RESIDENCE.

Age (in years)—Continued.							Place of residence.			
21–30	31–40	41–50	51–60	61–75	76–100	Age unknown.	Panama.	Colon.	Canal Zone.	Total.
	1	2						3	1	4
	2						2			2
	2	2	1				4	1	4	9
							1			1
									1	1
							2			2
							5	2		7
26	12	6		1			29	10	23	62
1								1		1
	1	1	1				3	1		4
							1	1	2	4
							1			1
1	2	1	1				2	1	3	6
								1		1
	1								1	1
	1	2	1	1			2	2	1	5
									2	2
	2	1	1	2			4	2	3	9
	1		1				1	1		2
	1	1					1	2		4
2	3	1					5	1	1	7
1							1			1
106	73	27	16	3			169	83	10	262
	1	1					8	3	4	15
							5	2	2	9
		1						3		3
1	1						2	1		3
								1		1
				1			1			1
	1						1		1	2
							1			1
	1			2			1	2		3
7	8	5	6				18	14	11	43
								1		1
2	5	3	2	1			10	2	2	14
							6	3		9
1	2	1					4			4
	1	2		2	1		5	1		6
1	1	4	3	3	1		8	2	3	13
		1	2				2		1	3
2	2	3	3				10	2		12
	1						1			1
			1				1			1
2	4	7		5	2		17	2	2	21

TABLE IV.—DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
General diseases.—Continued.									
Other tumors (tumors of the female genital organs excepted)	1	1		2				1	
Acute articular rheumatism	1				1				
Chronic rheumatism and gout	2	1		3					1
Scurvy	1			1			1		
Diabetes	1	1	1	1					
Addison's disease		1		1					1
Anemia, chlorosis	1	1		2					
Anemia, primary, pernicious		1		1					
Anemia, secondary, cause not determined		2		2			2		
Other general diseases		1		1					
Purpura hemorrhagica	1			1					
Alcoholism, acute	1	1		2					
Alcoholism, chronic	4		2	2					
Diseases of the nervous system and of the organs of special sense.									
Encephalitis	4	2		6		1	1		1
Simple meningitis	11	5	6	9	1	7	3	2	1
Cerebrospinal fever	2	3	1	4		1			3
Pneumococcus meningitis	7	4	1	10		3	2		1
Locomotor ataxia	1		1						
Other diseases of the spinal cord	3			3					
Cerebral hemorrhage, apoplexy	23	29	14	38		1			1
Softening of the brain	2	1	2	1					
Paralysis without specified cause	1	2	2	1			1		
General paralysis of the insane	9	1	5	5					1
Other forms of mental alienation	1		1						
Dementia precox	1		1						
Epilepsy	1	1		2		1			
Convulsions of infants (under 5 years of age)	2	4	2	4		3	3		
Neuritis		1		1					1
Tumor of the brain	1			1					
Diseases of the ears	2			2		1	1		
Otitis media	4	2		6		2	4		
Diseases of the circulatory system.									
Pericarditis	2	5	1	6		1	1	1	
Acute endocarditis	6	4	1	9		2		3	
Malignant endocarditis	4	2		6		1	1		1
Organic diseases of the heart	48	31	7	68	4			1	7
Angina pectoris		1	1						
Diseases of the arteries, atheroma, etc.	2			2					
Aneurysm	15	2	2	15					
Arteriosclerosis	14	12	3	22	1				
Embolism and thrombosis	2		1	1					
Phlebitis	1			1		1			
Diseases of the lymphatic system (lymphangitis, etc.)		2		2		2			
Lymphadenitis (nonvenereal)	1			1			1		
Hemorrhage; other diseases of the circulatory system	1			1					

CITIES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND RESIDENCE.—Continued.

Age (in years)—Continued.							Place of residence.			
21–30	31–40	41–50	51–60	61–75	76–100	Age unknown.	Panama.	Colon.	Canal Zone.	Total.
	1						2			2
	1						1			1
	1		1				2	1		3
							1			1
		1	1					1	1	2
							1			1
	1	1					1	1		2
1							1			1
							1		1	2
1							1			1
1							1			1
1	1							2		2
1	1	1	1				2	2		4
		1	1	1			2	2	2	6
1	2						14	1	1	16
	1						3	1	1	5
3	2						7	2	2	11
			1				1			1
	1	1	1				2	1		3
6	7	12	11	11	3		40	6	6	52
			2		1		1		2	3
		1			1		3			3
1	4	4					7	1	2	10
			1				1			1
1							1			1
	1						2			2
							5		1	6
								1		1
		1						1		1
							1		1	2
							1	1	4	6
	1	2	1				6	1		7
1	2	1	1				7	2	1	10
1	2						3	1		6
8	22	12	14	10	5		43	28	8	79
				1					1	1
			1		1		2			2
2	6	3	3	2		1	12	4	1	17
	1	5	11	4	5		20	5	1	26
1		1					1	1		2
							1			1
							2			2
							1			1
	1								1	1

TABLE IV. —DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
Diseases of the respiratory system.									
Diseases of the larynx	1			1		1			
Laryngitis		2		2		1			
Acute bronchitis	30	18	2	46		27	17	2	
Chronic bronchitis	5	7	2	10		3	4	1	
Broncho-pneumonia	73	55	20	108		51	34	6	3
Pneumonia (unqualified)	12	10	4	18		3	7		2
Lobar pneumonia	47	19	6	59	1	5	4		
Pleurisy	2	5	1	6			1	1	
Empyema	1	1		2					2
Pulmonary congestion, pulmonary apoplexy	3	1	1	3					
Gangrene of the lungs	3	3		6					
Asthma	2		1	1					
Other diseases of the respiratory system (tuberculosis excepted)	2			2		1			
Abscess of the lungs	3	1	1	3		1			1
Diseases of the digestive system.									
Diseases of the pharynx:									
Follicular tonsillitis		1		1				1	
Stricture of the esophagus		2		2					
Ulcer of the stomach	4		1	3		1			
Other diseases of the stomach (cancer excepted):									
Gastrectasis		1		1					
Acute gastritis	14	7	2	19		9	6		
Acute indigestion	4	4	1	6	1	3	2		
Diarrhea and enteritis (under 2 years)	99	102	15	185	1	156	45		
Colitis (under 2 years)	6	6	3	9		10	2		
Diarrhea and enteritis (2 years and over)	6	7		13			8	2	
Colitis (2 years and over)	1	3		4			2	1	
Appendicitis and typhlitis:									
Acute appendicitis	7	2	5	4				1	3
Chronic appendicitis	1			1					1
Hernia, intestinal obstructions		1		1					1
Inguinal hernia	4			4					
Other hernias	1	1	2						
Intestinal obstruction	8	2	1	8	1	3	1	1	
Other diseases of the intestines		2	1	1					
Constipation		1		1					
Duodenal ulcer	1			1					
Acute yellow atrophy of the liver	1			1					
Cirrhosis of the liver	9	7	3	11	2	1			1
Biliary calculi		4	2	2					
Other diseases of the liver	2			2		1	1		
Abscess of the liver (unqualified)	1	1	1	1					
Abscess of the liver (entamebic)	1			1					
Cholecystitis		1		1					
Diseases of the spleen	1		1						
Simple peritonitis (nonpuerperal)	2	4	1	5					1
Other diseases of the digestive system (cancer and tuberculosis excepted)		1		1					

CITIES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND RESIDENCE.—Continued.

Age (in years)—Continued.							Place of residence.			
21–30	31–40	41–50	51–60	61–75	76–100	Age unknown.	Panama.	Colon.	Canal Zone.	Total.
							1			1
			1				2			2
1				1			17	30	1	48
1	1			1	1		3	7	2	12
7	13	4	2	6	2		108	17	3	128
2	3	3	1		1		22			22
24	12	7	9	5			37	19	10	66
	3		2				4	3		7
							2			2
1	1		1		1		3	1		4
3	1	2					3	3		6
			1	1			2			2
		1						2		2
			2				2	2		4
							1			1
	1	1					2			2
1		1	1				1	3		4
	1						1			1
1	2	3					19	2		21
2			1				1	6	1	8
							152	43	6	201
							10	2		12
1	1			1			10	3		13
					1		3	1		4
	2	1	1	1			6		3	9
							1			1
							1			1
	1	2		1				3	1	4
		2					1		1	2
2	3						3	5	2	10
	1		1				1	1		2
		1					1			1
			1					1		1
1							1			1
2	4	3	2	3			10	4	2	16
		2	1		1		2	2		4
							2			2
1		1						2		2
1								1		1
			1				1			1
	1						1			1
2	1	1	1				3	3		6
	1							1		1

TABLE IV.—DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1-4	5-10	11-20
Nonvenereal diseases of the genito-urinary system and annexa.									
Acute nephritis	7	14	2	19	.....	10	5	3	1
Bright's disease (chronic nephritis)	70	40	23	84	3	.....	2	.....	3
Other diseases of the kidney and annexa	3	2	.....	5	.....	1	.....	.....	.....
Pyelo-nephrosis	8	5	2	11	.....	4	3	.....	.....
Calculi of the urinary passages	1	.....	1	.....	.....	.....	.....	.....	.....
Cystitis	2	1	.....	3	.....	.....	.....	.....	.....
Diseases of the prostate	1	.....	1	.....	.....	.....	.....	.....	.....
Hypertrophy of prostate	1	.....	.....	1	.....	.....	.....	.....	.....
Uterine tumor (noncancerous)	.....	4	.....	4	.....	.....	.....	.....	.....
Other diseases of the uterus	.....	2	.....	2	.....	.....	.....	.....	.....
Salpingitis and other diseases of the female genital organs	.....	7	1	6	.....	.....	.....	.....	.....
The puerperal state.									
Accidents of pregnancy	.....	2	.....	2	.....	.....	.....	.....	.....
Extra uterine pregnancy	.....	2	2	.....	.....	.....	.....	.....	.....
Hyperemesis gravidarum	.....	1	.....	1	.....	.....	.....	.....	.....
Puerperal hemorrhage	.....	7	1	6	.....	.....	.....	.....	.....
Other accidents of labor	.....	4	1	3	.....	.....	.....	.....	1
Puerperal septicemia	.....	8	3	5	.....	.....	.....	.....	2
Puerperal albuminuria and convulsions	.....	4	1	3	.....	.....	.....	.....	.....
Eclampsia	.....	10	1	9	.....	.....	.....	.....	1
Diseases of the skin and of the cellular tissue.									
Acute abscess: Phlegmon and cellulitis	2	1	.....	3	.....	.....	.....	.....	1
Diseases of the bones and of the organs of locomotion.									
Diseases of the bones (tuberculosis excepted)	2	.....	1	1	.....	.....	.....	.....	1
Malformations.									
Congenital malformations (stillbirth not included)	12	12	3	21	.....	21	3	.....	.....
Diseases of early infancy.									
Congenital debility, icterus, and sclerema	21	10	3	27	1	31	.....	.....	.....
Premature birth	40	30	9	60	1	70	.....	.....	.....
Atrophy of infants	1	.....	.....	1	.....	1	.....	.....	.....
Malnutrition	28	20	.....	48	.....	43	5	.....	.....
Other causes peculiar to early infancy (including various consequences of labor)	19	16	2	32	1	35	.....	.....	.....

TIES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND SIDENCE.—Continued.

Age (in years)—Continued.							Place of residence.			
1-30	31-40	41-50	51-60	61-75	76-100	Age unknown.	Panama.	Colon.	Canal Zone.	Total.
		2					14	6	1	21
12	22	26	20	16	8	1	63	39	8	110
1	1	2					4	1		5
1	2		1		2		6	5	2	13
	1						1			1
	1			2			3			3
				1					1	1
				1				1		1
1	3							4		4
		1	1				1	1		2
4	3						3	4		7
2								1	1	2
1	1						1		1	2
1							1			1
4	2	1					5	1	1	7
2	1						2	2		4
4	2						7		1	8
3	1						1	2	1	4
7	1	1					5	4	1	10
1		1					3			3
	1						1		1	2
							10	5	9	24
							21	9	1	31
							47	13	10	70
								1		1
							17	15	16	48
							22	9	4	35

TABLE IV.—DEATHS OF RESIDENTS OF THE CANAL ZONE AND THE PLACE OF

Cause of death.	Sex.		Color.			Age (in years).			
	M.	F.	W.	B.	Y.	Under 1 yr.	1–4	5–10	11–20
Old age.									
Senility	5	6	3	8					
Affections produced by external causes.									
Suicide by firearms	8		5	3					2
Suicide by cutting or piercing instruments	2			1	1				
Acute poisonings	3	3	2	4		1	1	1	
Burns (conflagration excepted)	3	2	1	4			4		
Accidental drowning	16	3	6	13				1	4
Traumatism by firearms	1		1						1
Traumatism by cutting or piercing instruments	1			1					
Traumatism by fall	12	2	6	8			7	1	
Traumatism by machines	1			1					1
Traumatism by other crushings (vehicles, etc)	18	2	6	14			1	2	2
Railroad traumatism	6	1	1	6			1		
Dynamite traumatism	1			1			1		
Injuries by animals	1			1					
Starvation		1		1			1		
Lightning	1			1					
Electricity (lightning excepted)	2	1		3					
Homicide by firearms	4	6	2	8					3
Homicide by cutting or piercing instruments	6	2	2	5	1				
Homicide by other means	3		2		1				
Fractures (cause not specified)		1	1						
Other external violence	3		1	1	1				1
Legal execution	3			3					
Ill-defined diseases.									
Ill-defined organic disease	2			2		1			
Sudden death	3	2	2	3				1	
Cause of death not specified or ill-defined	13	10	2	21		9	8		2
Infections of undetermined origin	2	1	1	2		1			
Grand total	1,204	889	296	1,760	37	567	245	50	104

CITIES OF PANAMA AND COLON, BY CAUSE, SEX, COLOR, AGE, AND RESIDENCE.—Continued.

Age (in years)—Continued.							Place of residence.			
21–30	31–40	41–50	51–60	61–75	76–100	Age unknown.	Panama.	Colon.	Canal Zone.	Total.
.....	.....	.....	1	3	7	.....	9	2	.....	11
5	.....	.....	.....	.....	.....	1	2	5	1	8
.....	1	1	.....	.....	.....	.....	1	1	.....	2
1	2	.....	.....	.....	.....	.....	3	2	1	6
.....	1	.....	.....	.....	.....	.....	2	2	1	5
5	6	2	1	.....	.....	.....	5	6	8	19
.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
.....	.....	1	.....	.....	.....	.....	.....	1	.....	1
2	.....	2	2	.....	.....	.....	6	3	5	14
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
6	5	1	.....	3	.....	.....	10	4	6	20
2	3	1	.....	.....	.....	.....	4	1	2	7
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
.....	1	.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
1	.....	.....	.....	.....	.....	.....	.....	.....	1	1
1	1	1	.....	.....	.....	.....	3	.....	.....	3
6	1	.....	.....	.....	.....	.....	7	3	.....	10
4	3	.....	1	.....	.....	.....	2	3	3	8
1	2	.....	.....	.....	.....	.....	1	1	1	3
.....	.....	.....	.....	.....	1	.....	1	.....	.....	1
.....	1	1	.....	.....	.....	.....	.....	2	1	3
2	1	.....	.....	.....	.....	.....	.....	3	.....	3
1	.....	.....	.....	.....	.....	.....	.....	1	1	2
1	2	.....	.....	1	.....	.....	5	.....	.....	5
4	.....	.....	.....	.....	.....	.....	14	6	3	23
2	.....	.....	.....	.....	.....	.....	1	1	1	3
324	313	199	146	97	45	3	1,297	554	242	2,093

TABLE IV-A.—DEATHS

Cause of death.	Sex.		Color.		Less than 1 year.
	M.	F.	W.	B.	
Typhoid fever	4	1	5		
Malarial fever, estivoautumnal	6	1	1	6	
Influenza	7	1	6	2	
Hemoglobinuric fever, unqualified	1		1		
Septicemia	3			3	
Tetanus	1			1	
Tuberculosis of the lungs	20	7	7	20	
Acute miliary tuberculosis	1			1	
Disseminated tuberculosis	3	1		4	
Syphilis, tertiary	2	1	1	2	
Syphilis, period not stated	2		1	1	
Cancer and other malignant tumors of the buccal cavity		1	1		
Cancer and other malignant tumors of the stomach and liver	3		1	2	
Cancer and other malignant tumors of the female genital organs		2	1	1	
Cancer and other malignant tumors of other organs and of organs not specified	1	1	1	1	
Diabetes	2		1	1	
Anemia, secondary, cause not determined	1			1	
Encephalitis	1			1	
Cerebrospinal fever	1			1	
Pneumococcus meningitis	1			1	
Cerebral hemorrhage, apoplexy	1			1	
Epilepsy	1		1		
Neurasthenia	1		1		
Pericarditis	1			1	
Acute endocarditis	1	1	1	1	
Malignant endocarditis	2			2	
Organic diseases of the heart	12	4	6	10	
Aneurysm	1		1		
Arteriosclerosis	1	1		2	
Hemorrhage; other diseases of the circulatory system	1			1	
Diseases of the thyroid body	1		1		
Acute bronchitis	1			1	1
Broncho-pneumonia	6		2	4	
Pneumonia (unqualified)		1		1	
Lobar pneumonia	12		3	9	
Pleurisy	1			1	
Ulcer of the stomach	2		1	1	
Diarrhea and enteritis (under 2 years)	2			2	1
Diarrhea and enteritis (2 years and over)	1			1	
Acute appendicitis	2		2		
Inguinal hernia	1			1	
Other diseases of the intestines	1	1	1	1	
Cirrhosis of the liver	3		1	2	
Other diseases of the liver	1		1		
Simple peritonitis	1		1		
Brights disease (chronic nephritis)	13	3	5	11	
Other diseases of the kidney and annexa	1			1	
Pyelo-nephrosis	1			1	
Cystitis	2			2	
Stricture of the urethra, nonvenereal	1			1	
Uterine tumor (noncancerous)		1		1	
Accidents of labor		1		1	
Puerperal hemorrhage		2		2	
Eclampsia		1		1	
Phlegmon and cellulitis	1			1	

[1] Includes deaths of all nonresidents, passengers off incoming ships, etc. Deaths of nonresidents

OF NONRESIDENTS.[1]

Age (in years).									Total.
1–4	5–10	11–20	21–30	31–40	41–50	51–60	61–75	Over 75	Unknown.	
		2	1	1	1					5
1	1	1	2	1		1				7
		1	3	2	1	1				8
							1			1
		1	1	1						3
				1						1
			10	8	4	4		1		27
				1						1
1				2		1				4
			2	1						3
			1		1					2
					1					1
						2		1		3
				1	1					2
					2					2
		1	1							2
			1							1
		1								1
			1							1
			1							1
					1					1
			1							1
							1			1
			1							1
			1		1					2
			1		1					2
			4	4	5		2		1	16
				1						1
					1		1			2
						1				1
					1					1
										1
1			1	2	1		1			6
				1						1
		1	6	1	1	2	1			12
					1					1
				2						2
1										2
1										1
			2							2
					1					1
				2						2
				2		1				3
				1						1
							1			1
		1	3	4	4	3	1			16
						1				1
					1					1
						2				2
					1					1
			1							1
			1							1
			1		1					2
			1							1
				1						1

[1] are not taken up in the statistical charts relating to Panama, Colon, and the Canal Zone.

TABLE IV-A.—DEATHS

Cause of death.	Sex.		Color.		Less than 1 year.
	M.	F.	W.	B.	
Diseases of the bones		1	1		
Congenital malformations		1		1	1
Congenital debility, icterus, and sclerema		1		1	1
Premature birth	2	1		3	3
Malnutrition		1		1	1
Senility		1	1		
Suicide by drowning	1			1	
Suicide by cutting or piercing instruments	1		1		
Burns	1			1	
Absorption of deleterious gases	1		1		
Accidental drowning	7	1	5	3	
Traumatism by cutting or piercing instruments		1		1	
Traumatism by fall	5		3	2	
Traumatism by machines	1		1		
Railroad traumatism	1		1		
Homicide by firearms	3		1	2	
Homicide by cutting or piercing instruments	2		2		
Homicide by other means	1			1	
Cause of death not specified or ill-defined	2		1	1	
Total	164	40	73	131	8

[1] Includes deaths of all nonresidents, passengers off incoming ships, etc. Deaths of nonresidents

OF NONRESIDENTS[1]—Continued.

Age (in years).										Total.
1–4	5–10	11–20	21–30	31–40	41–50	51–60	61–75	Over 75	Unknown	
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
.....	.....	2	3	1	2	.....	.....	.....	.....	8
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
.....	.....	.....	4	.....	.....	1	.....	.....	.....	5
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
.....	.....	1	2	.....	.....	.....	.....	.....	.....	3
.....	.....	.....	2	.....	.....	.....	.....	.....	.....	2
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
.....	.....	.....	2	.....	.....	.....	.....	.....	.....	2
5	1	13	63	46	35	20	10	2	1	204

are not taken up in the statistical charts relating to Panama, Colon, and the Canal Zone.

TABLE V.—DEATHS BY NATIONALITY OR NATIVITY, YEAR 1920.

Country.	Employees.		Nonemployees.		Total.		Grand total.
	Male.	Female.	Male.	Female.	Male.	Female.	
Antigua	6		4	4	10	4	14
Africa			1		1		1
Barbados	38	1	159	134	197	135	332
Bolivia				1		1	1
Bahamas	1		1		2		2
British Guiana			2	2	2	2	4
Chile			4	2	4	2	6
China			39	3	39	3	42
Colombia	8		59	40	67	40	107
Costa Rica	1		9	4	10	4	14
Cuba			4	1	4	1	5
Curacao			1	2	1	2	3
Demerara	1		2	4	3	4	7
Dominica			4	1	4	1	5
England			2	2	2	2	4
Ecuador			6	3	6	3	9
France	2		4	5	6	5	11
Fortune Island	1		1	1	2	1	3
Grenada	5		11	9	16	9	25
Greece	1		3	1	4	1	5
Guadeloupe	5	1	5	4	10	5	15
Germany			1		1		1
Guatemala	1				1		1
Haiti	1		2		3		3
Honduras			2	1	2	1	3
India			2	1	2	1	3
Italy	1		8	3	9	3	12
Jamaica	33		247	219	280	219	499
Japan			3	1	3	1	4
Martinique	4		20	24	24	24	48
Mexico	1		4	2	5	2	7
Montserrat	1		5	3	6	3	9
Nicaragua			3	1	3	1	4
Nassau	1		4	1	5	1	6
Norway	1				1		1
Panama	26	1	300	330	326	331	657
Peru	1		7	8	8	8	16
Porto Rico				1		1	1
St. Kitts	1				1		1
St. Lucia	5		19	16	24	16	40
St. Thomas			5	3	5	3	8
St. Vincent	3		6	4	9	4	13
Scotland			1		1		1
Spain	1		19	5	20	5	25
Trinidad	2	1	7	8	9	9	18
United States	16		33	15	49	15	64
Venezuela	1		4	5	5	5	10
Virgin Islands	1				1		1
Holland				1		1	1
Poland				1		1	1
Palestine				1		1	1
Portugal				1		1	1
Philippines			1		1		1
Santo Domingo			1		1		1
Syria			1		1		1
Switzerland			1		1		1
Denmark			1		1		1
Hungary	1				1		1
Grand Cayman				1		1	1
Roumania				1		1	1
Unknown			7	4	7	4	11
Totals	171	4	1,035	884	1,206	888	2,094

TABLE VI.—STATISTICS RE AMERICAN EMPLOYEES AND THEIR FAMILIES.

	Annual death rate per 1,000 population.
White employees from the United States:	
Disease	3.32
External causes	.95
Total	4.27
White women and children from the United States:	
Disease	3.80
External causes	.72
Total	4.52
White employees from the United States and their families:	
Disease	3.59
External causes	.82
Total	4.41

Number of American children born on the Isthmus during year 1920	205
Deaths among American children under 1 year of age	10
Infant mortality rate among American children (number of deaths per 1,000 births)	48.78

TABLE VII.—BIRTHS AND BIRTH RATES IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

Place.	Average population.	Births.			Rate per 1,000 population.		
		Total.	Alive.	Still-born.	Total.	Alive.	Still-born.
Year, 1920:							
Panama	60,935	2,532	2,376	156	41.55	38.99	2.56
Colon	26,078	1,014	962	52	38.88	36.89	1.99
Canal Zone	27,459	667	631	36	24.29	22.98	1.31
Total	114,472	4,213	3,969	244	36.80	34.67	2.13
Year, 1919:							
Panama	61,369	2,359	2,214	145	38.44	36.08	2.36
Colon	26,078	964	908	56	36.97	34.82	2.15
Canal Zone	26,511	732	695	37	27.61	26.22	1.39
Total	113,958	4,055	3,817	238	35.58	33.50	2.09

TABLE VIII.—INFANT MORTALITY RATES IN THE CANAL ZONE AND THE CITIES OF PANAMA AND COLON.

Place.	Average population.	Births.			Deaths among children under 1 year of age.	Death rate per 1,000 births.
		Male.	Female.	Total.		
Year, 1920:						
Panama	60,500	1,150	1,226	2,376	369	155.30
Colon	26,078	503	459	962	137	142.41
Canal Zone	27,459	348	283	631	60	95.09
Total	114,037	2,001	1,968	3,969	566	142.61
Year, 1919:						
Panama	61,369	1,190	1,024	2,214	342	154 47
Colon	26,078	479	429	908	141	155.29
Canal Zone	26,511	355	340	695	79	113 67
Total	113,958	2,024	1,793	3,817	562	147 24

TABLE IX.—DEATHS OF INFANTS BY CAUSE,

Cause of death.	Sex.		Color.		—1 week.	+1 week —1 month.
	M.	F.	W.	B.		
Measles		1		1		
Whooping cough		2		2		
Diphtheria and croup	1			1		
Influenza	4	2	1	5		
Dysentery	1			1		
Dysentery, bacillary	2			2		
Pyemia	1			1		
Tuberculosis of the lungs	1	4		5		
Acute miliary tuberculosis	2	1	1	2		
Tuberculous meningitis	1			1		
Disseminated tuberculosis	1	2		3		
Syphilis, hereditary	8	1	3	6	3	2
Encephalitis	1			1		
Simple meningitis	6	1	2	5		
Cerebro-spinal fever		1		1		
Pneumococcus meningitis	2	1		3		
Cerebral hemorrhage, apoplexy	1		1			
Epilepsy	1			1		
Convulsions of infants	1	2	1	2	1	
Diseases of the ears	3			3		
Pericarditis	1		1			
Acute endocarditis	1	1		2		
Malignant endocarditis		1		1		
Phlebitis	1			1		
Diseases of the lymphatic system (lymphangitis, etc.		2		2		
Diseases of the larynx	1			1		
Laryngitis		1		1		
Acute bronchitis	19	9	1	27	1	3
Chronic bronchitis	2		1	1		
Broncho-pneumonia	29	22	8	43	2	
Pneumonia (unqualified)	2	1		3		
Lobar pneumonia	2	3	1	4		1
Other diseases of the respiratory system (tuberculosis excepted)	1			1	1	
Abscess of lung	1		1			
Ulcer of the stomach	1			1		
Acute gastritis	7	2		9		
Acute indigestion	2	1		3	1	
Diarrhea and enteritis	78	78	16	140	2	9
Colitis	4	6	3	7		
Intestinal obstruction	3			3		
Cirrhosis of the liver		1		1		
Other diseases of the liver	1			1		1
Acute nephritis	4	6	1	9		1
Other diseases of the kidney and annexa	1			1		
Pyelo-nephrosis	4			4		
Congenital malformations (stillbirth not included)	9	12	3	18	10	3
Congenital debility, icterus, and sclerema	16	7	1	22	17	5
Premature birth	40	30	9	61	64	5
Congenital debility	5	2	1	6	5	1
Atrophy of infants	1			1		
Malnutrition	23	20		43	2	2
Other causes peculiar to early infancy (including various consequences of labor)	19	16	1	34	27	5
Acute poisonings		1	1			
Ill-defined organic disease	1			1		
Cause of death not specified or ill-defined	4	5	1	8	3	1
Infections of undetermined origin	1			1		
Totals	321	245	59	507	139	39

SEX, COLOR, AGE, AND PLACE OF RESIDENCE.

Age (by months).											Place of residence.			
1–2	2–3	3–4	4–5	5–6	6–7	7–8	8–9	9–10	10–11	11–12	Panama	Colon.	Canal Zone.	Total.
		1									1			1
1										1	2			2
									1		1			1
				1		1	2	1		1	2		4	6
				1							1			1
				1		1						1	1	2
		1											1	1
	1		1	2	1						5			5
		1			2						2	1		3
1												1		1
	1	1	1								2	1		3
2								1	1		6	3		9
									1		1			1
	2			2		1	1		1		6	1		7
			1								1			1
	1	1				1					1	1	1	3
	1										1			1
							1				1			1
	1						1				3			3
						1		2			1		2	3
		1									1			1
	1						1				1		1	2
						1					1			1
			1								1			1
		1	1								2			2
	1										1			1
1											1			1
	3	4		3	2	4	1	2	3	2	9	19		28
			1							1		2		2
2	7	4	6	2	6	3	8	2	2	7	43	7	1	51
		1		1		1					3			3
		1	2		1						2	2	1	5
												1		1
1												1		1
	1										1			1
1	2	2				2	2				9			9
		1					1				1	1	1	3
11	23	10	13	7	9	9	15	24	12	12	119	33	4	156
	2	2		1		1	1	1	1	1	8	2		10
					2					1		2	1	3
				1								1		1
											1			1
		1	2		1	1	1	1		2	7	2	1	10
	1											1		1
1							1		2		2	1	1	4
1	3			1		1		1	1		9	4	8	21
1											14	9		23
1											47	13	10	70
1											6		1	7
		1										1		1
6	8	5	4	3	3	2	4	1	1	2	15	15	13	43
	1	1							1		21	9	5	35
										1		1		1
	1												1	1
	1			1		2				1	6	1	2	9
	1										1			1
31	63	40	33	27	27	32	40	36	27	32	369	137	60	566

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
General diseases.								
Typhoid fever			2				3	
Typhoid bacillus carrier			1					
Paratyphoid fever								
Relapsing fever	1		1					
Malaria			1					
Estivoautumnal	45	8	218	4	3			
Tertian	30	3	62	1				
Quartan			6					
Mixed			1					
Clinical	1		5					
Cachexia								
Smallpox			1					
Varioloid								
Vaccina			8					
Measles	2	1	14					
Scarlet fever		1						
Whooping cough			1					
Diphtheria and croup			2					
Diphtheria bacillus carrier								
Influenza	156	27	414	4	2		18	
Dysentery, entamebic	6		5				1	
Dysentery, bacillary	1		6					
Leprosy								
Erysipelas								
Chickenpox			25	1				
Mumps		1	9					
Hemoglobinuric fever, unqualified								
Yaws			2					
Filariasis			1					
Purulent infection and septicemia	2	1	4					
Pyemia								
Septicemia	1							
Pyemia and septicemia, pneumococcic								
Tetanus							1	
Pellagra			1				1	
Tuberculosis of the lungs	4	1	37	2			13	
Acute miliary tuberculosis			1					
Tuberculous meningitis								
Abdominal tuberculosis			1				1	
Pott's disease							2	
Tuberculosis of bones and joints								
Tuberculosis of other organs			1					
Tuberculosis of the larynx								
Tuberculosis of the skin			1					

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
	2	1	3	4					1	8				4	1			20	9
				4														5	
										1								1	
										5								7	
																		1	
21	21	20	27	31	1				1	12	1	3				2		411	7
12	16	12	13	26						10		2						187	
1				1														8	
																		1	
2	1	2																11	
										1								1	
	1	4	11	6								1						24	
1																		1	
																		8	
8	30	28	9	7														99	
	2	1	1						1									5	1
		3	5	4														13	
5	11	6	7	14				1										45	1
		1																1	
32	52	63	32	57	3		2	4	11	42	2	6		2			1	887	43
	1	1		2						11								26	1
								3		1								8	3
		1							1	1								2	1
1				2						1		3						7	
2	30	21	4	4						1	1	1						90	
25	6	1	3	4				1		2		1						52	1
									1										1
			1	2														5	
																		1	
	2	1		1					1	1								12	1
							1												1
								1	1									1	1
						1	2		2										2
									1										1
									1	1								2	2
6	3	8	3	12		2		4	7	15		1		3				92	29
								4	5									1	2
		1		1	1			2										2	3
		1	1	3						1								7	1
				3														3	2
			3	1				1										4	1
				1						1								3	
	1																	1	
																		1	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
General diseases.—Continued.								
Tuberculosis of the lymph glands			5					
Tuberculosis of the genitourinary organs	1		1					
Tuberculous abscess	1							
Disseminated tuberculosis							10	
Rickets								
Syphilis:								
Primary	1		6					
Secondary	2		9					
Tertiary	7		94				1	
Cerebro-spinal	13		13				2	
Hereditary								
Period not stated			2					
Gonococcus infection								
Gonorrhea	33		211					
Gonorrheal arthritis			7					
Gonorrheal bubo			2					
Gonorrheal orchitis and epididymitis	4		3					
Gonorrheal ophthalmia			2					
Soft chancre	13		121					
Adenitis chancroidal	1		5					
Cancer and other malignant tumors of the buccal cavity	1							
Cancer and other malignant tumors of the stomach and liver, esophagus, and pharynx			3		1			
Cancer and other malignant tumors of the peritoneum, intestines, rectum	1		1		1			
Cancer and other malignant tumors of the female genital organs				1				
Cancer and other malignant tumors of the breast								
Cancer and other malignant tumors of the skin			1					
Cancer and other malignant tumors of other organs and of organs not specified	3		3				2	
Other tumors (tumors of the female genital organs excepted)	3		9	1				
Acute articular rheumatism								
Chronic rheumatism and gout	1			1				
Gout								
Arthritis deformans								
Scurvy								
Diabetes	2		1					
Glycosuria								
Exopthalmic goiter		1						
Leukemia								
Hodgkin's disease			1					
Anemia, secondary, cause not determined	1	1	4					

OF THE PANAMA CANAL FOR THE YEAR 1920—Continued.

Nonemployees.										Nonresidents.						Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.			
White.			Black.		White.			Black.		White.		Black.		White	Black.		
Soldiers.	Others.				Soldiers.	Others.											
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
1	3	4		3												16	
																2	
			2													3	
			1	1				7	6					1		2	24
				2						1						3	
8	1			1						16		3				36	
11		1	3	2						17		1				46	
9	3	7	6	68					1	21		4				219	2
	6		4	3		1				5	1			1		45	4
			4					2		1						5	2
				1						2						5	
		3	1	13						13	1					31	
20	11		24	5						123		14				441	
				1						3		1				12	
1				1						2		1				7	
	1									5						13	
1	1		2	5												11	
5	2	1	12	3						125		15				297	
										13						19	
1			2					1								4	1
	1	1					1	1		3	1					9	3
3						1				1						6	2
				11					1							12	1
		2		1					1							3	1
1										1						3	
						1				1	1			1		8	4
1		4	3	2						2		1				26	
	3			2						5						10	
											1					3	
	1															1	
		1														1	
			1											1		1	1
1	2	2					1			2	1					11	1
	1															1	
		2		2												5	
	1															1	
																1	
	2	1		2						2	2					15	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M	F.	M.	F.	M.	F.
General diseases—Continued.								
Other general diseases	5	1	1					
Purpura hemorrhagica							1	
Alcoholism (acute or chronic)	11		1					
Alcoholism, acute	14		2					
Alcoholism, chronic	3							
Alcoholic psychosis								
Chronic lead poisoning	2		3					
Other chronic occupational poisonings								
Other chronic poisonings	1							
Drug habit								
Diseases of the nervous system and of the organs of special sense.								
Encephalitis							1	
Simple meningitis							1	
Cerebrospinal fever			1				1	
Pneumococcus meningitis							2	
Locomotor ataxia								
Other diseases of the spinal cord								
Acute anterior polio-myelitis								
Cerebral hemorrhage, apoplexy			1		1		3	
Softening of the brain							1	
Paralysis without specified cause	3		3					
General paralysis of the insane								
Other forms of mental alienation			1					
Dementia precox			3					
Manic depressive psychosis								
Toxic psychosis			1					
Epilepsy			7					
Convulsions, nonpuerperal (5 years and over)			1					
Convulsions of infants (under 5 years of age)								
Chorea								
Hysteria	2	2						
Neuralgia	2		2					
Neuritis	10		7					
Other diseases of the nervous system	6	5	8					
Organic disease of the brain	1							
Tumor of the brain								
Neurasthenia	9	3	3					
Diseases of the eyes and their annexa	9	1	57	1				
Follicular conjunctivitis			2					
Trachoma			7					
Cornea	17		28					
Iris	7	1	17					

OF THE PANAMA CANAL FOR THE YEAR 1920.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
	15	12	4	3						2								43	
										7								7	1
5	2		1	2	1					8								30	1
11	3								1	5								35	1
3	4		1			1				2								13	1
			2							1								3	
																		5	
			1															1	
										1								2	
										1								1	
				1						2								3	1
1					1	2		1	1									1	6
1																		2	1
							1	1	1										5
				1						1								2	
								1											1
	1	1																2	
	1			3					4									5	8
										1								1	1
1	1		1	2						1								12	
3			6			4		5										9	9
6	3	3	9	14							2		1					39	
12	1	2	22	19		1				9		1						69	1
1				1						1								3	
				2						1								4	
1			1	3						2								14	
		1		3														5	
	2			3		1												5	1
1		3																4	
2	3	6	1	2						1								19	
1		2		1														8	
1	4	5	1	5						5								38	
3	4	6		1				1		4		3						40	1
	1			1														3	
										1								1	
8	2	7		12						15		1						60	
19	9	3	10	28						6			1					144	
	1		1	1						2								7	
5	1									1		1						15	
5	3	4	4	9						4								74	
6			1	9						4								45	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the nervous system and of the organs of special sense.—Continued.								
Diseases of the eyes and their annexa—Continued:								
Lens			4					
Fundus			1					
Diseases of the ears	3			1				
Otitis, external	3	2	7					
Otitis media	4	4	7	1				
Diseases of the circulatory system.								
Pericarditis			1					
Acute endocarditis								
Malignant endocarditis				1			2	
Organic diseases of the heart	6		12				6	
Angina pectoris			1					
Diseases of the arteries, atheroma, etc								
Aneurysm			4				1	
Arteriosclerosis	1		1				1	
Diseases of the veins (varices, hemorrhoids, phlebitis, etc.)	2		3					
Hemorrhoids	20		20	1				
Varices	2		1					
Varicocele	3		5					
Phlebitis	1							
Diseases of the lymphatic system (lymphangitis, etc.)	12		13					
Lymphadenitis (nonvenereal)	21	1	41					
Hemorrhage; other diseases of the circulatory system	6		1					
Diseases of the respiratory system.								
Diseases of the nasal fossæ	30	11	22					
Adenoid vegetations								
Myiasis of nasal fossæ and sinuses	1							
Diseases of the larynx			1					
Laryngitis	1							
Diseases of the thyroid body			2					
Acute bronchitis	23	5	55	3				
Chronic bronchitis	4		2					
Broncho-pneumonia	1		2				3	
Pneumonia (unqualified)							1	
Lobar pneumonia			17		1		12	
Pleurisy	2	1	8	1				
Empyema			2					
Pulmonary congestion, pulmonary apoplexy								

OF THE PANAMA CANAL FOR THE YEAR 1920.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
		1		2														7	
2		1		3						1								8	
2		2		2						2								12	
17	4	7	3	1						10								54	
10	6	12	2	5				2		4								55	2
		1							1	1								3	1
	1			2		1												3	1
	1			1					1							1		3	1
	3	3	3	18					2	5	1			1				51	9
										1								2	
			1	1						1								3	
			1	1														5	1
1	1	1	1					1	2	1		1						8	4
2	1		1	2						3	1							16	
15	2	5	1	11						11	1	1						88	
4		1																8	
9	1		1															19	
	1			1				1		1	1							5	1
3	2	4	4	6						2								46	
16	2	3	12	5						16		3						120	
3	3		2	2						3								20	
32	13	17	2	10						7	4	1						140	
	9	8	5	4														26	
																		1	
																		1	
				3														4	
		5		2						2	1			1				12	1
14	40	41	28	23						16		2						250	
1	4	6	1	3						6	1	2						30	
1			4	4		2	2	3	2			1						13	12
																			1
3	4	4	11	4		1		5	5	5		1			1	1		49	26
6	2	3	4	3						9	1	1						41	
	1	1	2							1								8	
			1															1	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the respiratory system—Continued.								
Gangrene of the lungs								
Asthma	1	1	13	1				
Pulmonary emphysema	1							
Other diseases of the respiratory system (tuberculosis excepted)								
Abscess of lungs	2							
Diseases of the digestive system.								
Diseases of the mouth and annexa	2		4	1				1
Diseases of the teeth and gums	3	3	13	1				
Stomatitis								
Diseases of the pharynx	3		7					
Pharyngitis	7		3					
Follicular tonsillitis	57	30	44	2				
Ulcer of the stomach	8		4				1	
Other diseases of the stomach (cancer excepted)	4		6					
Acute gastritis	13		15					
Chronic gastritis	4		7					
Acute indigestion	10	1						
Diarrhea and enteritis (under 2 years)								
Colitis (under 2 years)								
Diarrhea and enteritis (2 years and over)	11		4					
Colitis (2 years and over)	3	7	4					
Ankylostomiasis	1		29					
Intestinal parasites	4		9					
Ascariasis	2							
Bilharziasis, intestinal								
Teniasis	1							
Strongyloidosis			1					
Appendicitis and typhlitis			1					
Acute appendicitis	11	3	5		2			
Chronic appendicitis	17	6	3					
Hernia, intestinal obstructions								
Inguinal hernia	20	1	57				2	
Other hernias	4		3	1	1			
Intestinal obstruction							1	
Other diseases of the intestines	21	9	9	3				
Constipation	9	2	18					
Duodenal ulcer	4		1				1	
Acute yellow atrophy of the liver								
Cirrhosis of the liver	1		2		1			
Biliary calculi	2		2					
Other diseases of the liver	5		1					

OF THE PANAMA CANAL FOR THE YEAR, 1920.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
									1										1
3	2	7	1	4		1				2		2						37	1
2										1								4	
	1									1								2	
										2								4	
5	3	1	1	2						2								21	1
1	2	10	1	8						5	1							48	
	1		1	3														5	
2	4	2	1	2						3	1	1						26	
1	4	5		1						2								23	
76	104	118	38	100					1	18	7	2						596	1
	1	3								2								18	1
3	2	3		4						1	2							25	
6	3	2	2	7						8								56	
3	2	1		1						3								21	
3	1	4																19	
	1	1	4	2				2										8	2
	1	4	1	2						2								10	
1	3	6		4					2	3	1	2						35	2
2		5	2	2						4	1							30	
		2	1	1						1	1	3						39	
1		2		2						2	1	1						22	
	2	1	1	4						5	5							20	
		1																1	
										1	3							5	
																		1	
1		1																3	
64	9	29	2	9			1	1		10	3			2				145	6
10	2	21		5						5	3	1						73	
1		1								1								3	
33	10	4	22	2				1		25		5						179	3
4	1	6	3	5						1		1						29	1
		1						3										1	4
7	8	12	4	19						16	2							110	
1	2	8	4	5						10	3	1						63	
1	1	1								4								12	1
1																		1	
	1	1						2		3								8	3
		8		1			1		1		1							14	2
3	1	1	1							7	1	1						21	

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of the digestive system.—Continued.								
Other diseases of the liver—Continued:								
Abscess of liver (unqualified)	1		1					
Abscess of the liver, entamebic	1							
Cholecystitis	4		2	1				
Diseases of the spleen								
Simple peritonitis (nonpuerperal)	2		2					
Other diseases of the digestive system (cancer and tuberculosis excepted)	3	1	3					
Nonvenereal diseases of the genito-urinary system and annexa.								
Acute nephritis	2							
Bright's disease (chronic nephritis)	7		20			2		3
Other diseases of the kidney and annexa	4	2	1					
Movable kidney				1				
Pyelo-nephrosis	5	1	3					
Calculi of the urinary passages	16	1	2					
Diseases of the bladder			2					
Cystitis	4	3	1	2				
Diseases of the urethra, urinary abscess, etc	3	1	8					
Stricture of the urethra, nonvenereal	6		24					
Vesico-vaginal fistula								
Diseases of the prostate								
Acute prostatitis			1					
Chronic prostatitis	3							
Abscess of the prostate								
Hypertrophy of prostate			1					
Nonvenereal diseases of the male genital organs	8		46					
Hydrocele	5		12					
Lymph scrotum and varix								
Uterine hemorrhage (nonpuerperal)		5						
Uterine tumor (noncancerous)								
Other diseases of the uterus		6		5				
Metritis				1				
Cysts and other tumors of the ovary								
Salpingitis and other diseases of the female genital organs		3		2				1
Nonpuerperal diseases of the breast (cancer excepted)								
Benign tumor of breast								
The puerperal state.								
Normal labor		1						
Accidents of pregnancy				1				
Extra-uterine pregnancy								
Hyperemesis gravidarum								
Abortion		8		2				
Puerperal hemorrhage								

OF THE PANAMA CANAL FOR THE YEAR, 1920.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
							1			1								2	1
										1								2	
4		6		1						2	1							21	
2										1								3	
		3		8					1									15	1
1	1	1								1								11	
1	4		7	7					2	1		1		2				22	2
3	3	2	3	5		1	3	5	3	7		1		2				51	24
3		16	2	18				3	1	1	1							48	4
		2									1							5	
6	1	21	2	9				2		4	2							54	2
3	3	7	3							2		1						38	
1		2		1														6	
3	1	7		10						3	1							35	
	1	1	2	1						6								23	
2	1		2							2		3						40	
				2														2	
1																		1	
2																		2	
						1												3	1
1																		1	
	1		2					1										4	1
5	6		30							11		2						108	
4	1		5							3								30	
1																		1	
		7		3							2							18	
		4		25					3		1							31	3
		29		72							9		1					122	
		4		6														11	
		8		24							1							34	
		19		61					4		2							87	5
		3		11														14	
		1		1							1							3	
		210		121							1							333	
		16		26			1		1									43	2
		3		7							1							11	
		8		15														23	
		51		24							1							86	
				5					1									5	1

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
The puerperal state.—Continued.								
Other accidents of labor								
Puerperal septicemia								
Puerperal albuminuria and convulsions								
Eclampsia								
Following childbirth (not otherwise defined)								
Puerperal diseases of the breast								
Diseases of the skin and of the cellular tissue.								
Gangrene			1					
Raynaud's disease								
Furuncle	10		2					
Carbuncle	5		2					
Acute abscess	9		34					
Phlegmon and cellulitis	23		65				1	
Trichophytosis	1	1	3					
Scabies	1		3					
Chiggers (*Pulex penetrans*)								
Elephantiasis								
Myiasis of skin			1					
Dhobie itch	7	3	2					
Prickly heat			8					
Ulcer of the skin	1		44					
Oriental sore (Leishmaniasis)								
Tropical ulcer				1				
Impetigo contagiosa		1	2					
Urticaria	1							
Ingrowing nail	6	1	3					
Other diseases of the skin and annexa	22	3	19	1				
Diseases of the bones and of the organs of locomotion.								
Diseases of the bones (tuberculosis excepted)	3		1				1	
Caries (nontuberculous)								
Mastoid abscess			4					
Osteomyelitis	2		3					
Periostitis	4		1					
Diseases of the joints (tuberculosis and rheumatism excepted)	1		4					
Ankylosis								
Arthritis	7		19	2				
Synovitis	1		2					
Other diseases of the organs of locomotion	19	3	27	3				
Malformations.								
Congenital malformations (stillbirth not included)	2		6					

OF THE PANAMA CANAL FOR THE YEAR, 1920.—Continued.

Nonemployees.										Nonresidents.								Total discharges.	Total deaths.
Discharges.					Deaths.					Discharges.				Deaths.					
White.			Black.		White.			Black.		White.		Black.		White		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
		22		15			2		1		2							39	3
							1												1
		3		8					3									11	3
		2		6					5									8	5
		1																1	
		1		4														5	
										1								2	
										1								1	
2	3	2	2	2						9								32	
1	1	2								1								12	
4	7	11	12	15					1	8	1	3						104	1
5	2	5	6	4					1	16		2						127	2
	1									1								7	
	2		2									1						9	
										1								1	
				3														3	
																		1	
1	4	1	2	1						1								22	
										1								9	
	1	2	2	2						6		1						59	
1																		1	
		1	1	1														4	
1	7	2	3	1						3		1						21	
1	2	1								1								6	
2	1	6																19	
4	10	10	4	10						25	1							109	
3		3	1	1		1				1								13	2
										1								1	
1	2	1	1															9	
1	1	2	1								1							11	
																		5	
2			1	4							1							13	
		1								1								2	
3		2	2	6						4	1	2						48	
1				1						1								6	
9	2	6		3						6								78	
5	21	3	10	3		2	1	1	1	2								52	5

TABLE X.—DISCHARGES AND DEATHS IN THE HOSPITALS

Diseases.	Employees.							
	Discharges.				Deaths.			
	White.		Black.		White.		Black.	
	M.	F.	M.	F.	M.	F.	M.	F.
Diseases of early infancy.								
Newborn child								
Premature birth								
Congenital debility								
Atrophy of infants								
Malnutrition								
Other causes peculiar to early infancy (including various consequences of labor)								
Old age.								
Senility	1							
Senile dementia								
Affections produced by external causes.								
Suicide by firearms	1							
Suicide by cutting or piercing instruments								
Poisoning by food	9	1	5					
Other acute poisonings	3	1	1				1	
Venomous bites and stings		1						
Burns (conflagration excepted)	8	1	22				1	
Absorption of deleterious gases (conflagration excepted)			6					
Traumatism by firearms			2					
Traumatism by cutting or piercing instruments	10		114				1	
Traumatism by fall	27	6	118		1		1	
Traumatism in mines and quarries								
Traumatism by machines	10		26				1	
Traumatism by other crushings	11	4	54				1	
Railroad traumatism			1					
Injuries by animals			2					
Excessive cold			1					
Effects of heat			1					
Heat exhaustion			3					
Lightning								
Electricity (lightning excepted)	1		2					
Homicide by firearms								
Homicide by cutting or piercing instruments								
Homicide by other means								
Fractures (cause not specified)	5		7					
Dislocations			3					
Sprains	5	1	14					
Other external violence	35		247					
Ill-defined diseases.								
Ill-defined organic disease								
Sudden death	1		1					
Cause of death not specified or ill-defined	1							
Infections of undertermined origin	14	2	12				2	
No disease	8	7	32	1				
Feigned disease								
Totals	1164	214	3048	58	16		114	2

OF THE PANAMA CANAL FOR THE YEAR, 1920.—Continued.

Nonemployees.										Nonresidents.									
Discharges.					Deaths.					Discharges.				Deaths.				Total discharges.	Total deaths.
White.			Black.		White.			Black.		White.		Black.		White.		Black.			
Soldiers.	Others.				Soldiers.	Others.													
M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
....	117	110	60	63	....	....	....	....	....	....	....	....	....	....	....	....	....	350	....
....	....	2	1	3	....	2	....	....	6	....	....	....	....	....	....	....	....	6	8
....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	2
....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....
....	9	4	18	6	....	....	....	12	10	....	....	....	....	....	....	....	....	37	22
1	....	....	1	3	....	....	....	5	3	....	....	....	....	....	....	....	....	5	8
....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....
....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....
....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	1	2
....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1
3	....	....	1	....	....	....	....	....	....	5	2	....	....	....	....	....	....	26	....
1	1	....	3	2	....	....	....	....	....	....	....	....	....	....	....	....	....	12	1
....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....
2	5	3	6	5	....	....	1	1	....	13	....	2	....	....	....	....	....	67	3
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	....
9	1	....	1	3	1	....	....	....	....	1	....	....	....	....	....	....	....	17	1
1	3	1	3	7	....	....	....	....	....	6	....	2	....	....	....	....	....	147	1
15	7	8	26	10	2	1	....	2	....	37	....	5	....	....	....	....	....	259	7
1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....
1	1	....	2	....	....	....	....	....	....	9	....	....	....	1	....	....	....	49	2
16	8	4	13	1	3	1	....	....	....	8	....	....	....	....	....	....	....	119	5
2	....	....	1	1	1	....	....	1	1	1	....	....	....	....	....	....	....	6	3
2	1	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	7	....
....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	....
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....
1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	5	....
....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....
....	....	....	....	....	....	....	....	....	2	....	....	....	....	1	....	....	....	3	3
....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1
....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1
5	3	2	6	8	....	....	....	....	....	4	2	....	....	....	....	....	....	42	....
2	1	1	....	2	....	....	....	....	....	3	....	....	....	....	....	....	....	12	....
3	....	1	....	....	....	....	....	....	....	9	....	....	....	....	....	....	....	33	....
27	6	2	19	6	....	....	....	1	....	35	....	5	....	....	....	....	....	382	1
....	1	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	2	1
....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....
....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	3	....
16	6	9	1	8	....	....	....	1	1	1	....	1	....	....	....	....	....	70	4
27	35	89	19	54	....	....	....	....	....	24	17	....	....	....	....	....	....	313	....
2	....	....	....	....	....	....	....	....	....	2	....	1	....	..	....	....	....	5	....
878	848	1417	726	1500	15	33	22	98	119	1121	120	128	2	23	2	4	1	11224	449

TABLE XI.—CONSOLIDATED HOSPITAL AND ASYLUM REPORT.
(A. = White Americans; F. = White foreigners; B = Black.)

	Remaining January 1, 1920.			Admitted.			Died.			Discharged.		
	A.	F.	B.	A.	F.	B.	A.	F.	B.	A.	F.	B.
Ancon Hospital:												
Employees	24	15	159	981	143	2,882	9	3	83	965	144	2,819
Army and Navy patients	20	...	...	827	...	...	4	...	...	768	...	...
Panama pay patients	...	...	1	...	3	12	...	...	2	...	...	1
Other pay patients	49	62	56	1,560	989	1,696	16	23	115	1,539	996	1,572
Charity patients	10	6	16	343	50	318	4	1	17	333	53	278
Total	103	83	232	3,711	1,185	4,908	33	27	217	3,605	1,194	4,669
Corozal Hospital (insane):												
Employees	1	2	15	1	1	15	...	...	2	1	1	8
Army and Navy patients	...	...	...	25	...	...	...	...	...	24	...	...
Panama pay patients	3	59	209	...	20	66	...	8	17	...	8	53
Other pay patients	2	4	16	4	5	16	...	1	...	5	7	11
Charity patients	1	9	63	2	...	15	...	...	4	1	1	17
Total	7	74	303	32	26	112	...	9	23	31	17	89
Grand total	110	157	535	3,743	1,211	5,020	33	36	240	3,636	1,211	4,758
Corozal farm (cripples):												
Employees	...	9	41	...	1	11	...	...	...	...	6	26
Chronic ward:												
Charity patients	...	...	26	...	1	6	...	...	2	...	...	2
Colon Hospital:												
Employees	2	...	14	289	52	698	5	...	30	240	30	303
Army and Navy patients	...	...	...	105	...	...	6	...	...	68	...	...
Panama pay patients	...	...	...	2	17	129	...	3	15	1	2	24
Other pay patients	12	5	7	412	316	526	11	17	47	323	193	347
Charity patients	2	...	...	62	9	78	1	...	5	55	8	54
Total	16	5	21	870	394	1,431	23	20	97	687	233	728
Palo Seco Leper Asylum:												
Panama pay patients	...	3	41	...	2	5	...	...	3	...	...	4
Charity patients	...	1	32	...	...	4	...	...	1	...	1	5
Total	...	4	73	...	2	9	...	...	4	...	1	9
Grand totals:												
Employees	27	26	229	1,271	197	3,606	14	3	115	1,206	181	3,156
Army and Navy patients	20	...	...	957	...	...	10	...	...	860	...	...
Panama pay patients	3	62	251	2	42	212	...	11	37	1	11	81
Other pay patients	63	71	79	1,976	1,310	2,238	27	41	162	1,867	1,196	1,930
Charity patients	13	16	137	407	60	421	5	2	30	389	63	355
Total	126	175	696	4,613	1,609	6,477	56	57	344	4,323	1,451	5,522

TABLE XI.—CONSOLIDATED HOSPITAL AND ASYLUM REPORT.—Continued.
(A. = White Americans; F. = White foreigners; B. = Black.)

	Transferred.			Remaining December 31, 1920.			Average number constantly in hospital.			
	A.	F.	B.	A.	F.	B.	A.	F.	B.	Total.
Ancon Hospital:										
Employees	1	5	53	30	6	86	29.20	10.69	151.99	191.88
Army and Navy patients	12	....	....	63	....	....	39.01	....	....	39.01
Panama pay patients	....	2	11	....	....	....	....	.10	.16	.26
Other pay patients	5	1	18	49	31	47	55.32	48.23	63.12	166.67
Charity patients	....	1	26	16	1	13	10.31	2.93	15.36	28.60
Total	18	9	108	158	38	146	133.84	61.95	230.63	426.42
Corozal Hospital (insane):										
Employees	....	....	....	1	2	24	.49	1.12	18.96	20.57
Army and Navy patients	....	....	....	1	....	....	2.45	....	....	2.45
Panama pay patients	....	1	5	3	62	196	3.00	60.73	188.18	251.91
Other pay patients	....	....	....	1	1	21	1.85	3.49	16.00	21.34
Charity patients	....	....	2	2	8	55	.39	8.44	55.06	63.89
Total	....	1	7	8	73	296	8.18	73.78	278.20	360.16
Grand total	18	10	115	166	111	442	142.10	136.03	509.30	787.43
Corozal farm (cripples):										
Employees	....	....	....	....	4	26	....	4.87	28.94	33.81
Chronic ward:										
Charity patients	....	....	3	....	1	25	....	.46	25.91	26.37
Colon Hospital:										
Employees	45	21	369	1	1	10	4.30	.99	11.14	16.43
Army and Navy patients	31	....	....	....	....	....	1.80	....	....	1.86
Panama pay patients	1	12	89	....	....	1	.01	.14	.80	.95
Other pay patients	84	104	129	6	7	10	8.85	5.30	11.12	25.24
Charity patients	6	1	17	2	....	2	1.53	.16	1.22	2.91
Total	167	138	604	9	8	23	16.52	6.59	24.28	47.39
Palo Seco Leper Asylum:										
Panama pay patients	....	....	....	....	5	39	....	4.01	39.34	43.35
Charity patients	....	....	....	....	....	30	....	.88	32.01	32.89
Total	....	....	....	....	5	69	....	4.89	71.35	76.24
Grand totals:										
Employees	46	26	422	32	13	146	33.99	17.67	211.03	262.69
Army and Navy patients	43	....	....	64	....	....	43.32	....	....	43.32
Panama pay patients	1	15	105	3	67	236	3.01	64.98	228.48	296.47
Other pay patients	89	105	147	56	39	78	65.99	57.02	90.24	213.25
Charity patients	6	2	48	20	10	125	12.23	12.87	129.56	154.66
Total	185	148	722	175	129	585	158.50	152.64	659.31	970.39

TABLE XII.—CONSOLIDATED DISPENSARY REPORT.

EMPLOYEES TREATED IN QUARTERS.

Place.	Remaining Jan. 1, 1920.		Admitted.		Died.		Discharged.		Transferred.		Remaining Dec. 31, 1920.		Days lost.		
	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	W.	B.	Total.
Ancon	3	7	1,938	1,704	...	...	1,907	1,660	33	43	1	8	4,468	5,331	9,799
Balboa	3	...	2,458	32	...	...	2,455	31	...	...	6	1	5,474	225	5,699
Pedro Miguel	1	1	248	135	...	...	241	128	8	8	...	...	742	403	1,145
Gatun	...	...	211	80	...	...	202	76	8	4	1	...	672	242	914
Cristobal	5	26	1,257	1,297	...	...	1,215	1,263	38	48	9	12	3,293	7,911	11,204
Total	12	34	6,112	3,248	...	...	6,020	3,158	87	103	17	21	14,649	14,112	28,761

ALL CASES TREATED BUT NOT EXCUSED.

Place.	Employees.			Nonemployees.			Total.		
	White.	Black.	Total.	White.	Black.	Total.	White.	Black.	Total.
Ancon	14,979	59,496	74,475	12,323	18,273	30,696	27,302	77,869	105,171
Balboa	52,079	18,929	71,008	50,572	14,482	65,054	102,651	33,411	136,062
Pedro Miguel	9,774	27,270	37,044	17,664	26,749	44,413	27,438	54,019	81,457
Gatun	4,079	22,815	26,894	7,071	10,425	17,496	11,150	33,240	44,390
Cristobal	17,307	37,081	54,388	20,517	27,236	47,753	37,824	64,317	102,141
Total	98,218	165,591	263,809	108,147	97,265	205,412	206,365	262,856	469,221

TABLE XIII.—CONSOLIDATED ADMISSION REPORT.

	White.	Black.	Total.
Admissions to hospitals, excluding Corozal farm and chronic ward	6,220	6,460	12,680
Admissions of employees to quarters	6,112	3,248	9,360
Total admissions to hospitals and quarters	12,332	9,708	22,040
Less number of patients transferred between hospitals and from quarters to hospitals, whose admissions are duplicated in the above figures	453	738	1,191
Net admissions to hospitals and quarters	11,879	8,970	20,849
EMPLOYEES.			
Employees admitted to hospitals	1,467	3,595	5,062
Employees admitted to quarters	6,112	3,248	9,360
Total admissions of employees	7,579	6,843	14,422
Less number transferred between hospitals and from quarters to hospitals, whose admissions are duplicated in the above figures	92	441	533
Net admissions of employees	7,487	6,402	13,889
Annual admission rate per thousand employees to hospitals and quarters	1,597.05	400.50	671.84

TABLE XIV.—NUMBER OF EMPLOYEES CONSTANTLY SICK IN HOSPITALS AND QUARTERS.

	White.	Black.	Total.
Hospitals:			
Ancon	41.50	170.95	212.45
Colon	5.29	11.14	16.43
Total	46.79	182.09	228.88
Quarters:			
Ancon	12.20	14.57	26.77
Balboa	14.96	.61	15.57
Pedro Miguel	2.03	1.10	3.13
Gatun	1.83	.67	2.50
Colon	9.00	21.61	30.61
Total	40.02	38.56	78.58

TABLE XV.—AVERAGE NUMBER OF DAYS IN HOSPITALS OR QUARTERS FOR EACH ADMISSION OF SICK EMPLOYEE.

	White.	Black.	Total.
Hospitals:			
Ancon	12.38	19.58	17.59
Colon	5.77	5.69	5.72
Total (average)	10.85	16.91	15.17
Quarters:			
Ancon	2.38	3.33	2.82
Balboa	2.22	7.00	2.28
Pedro Miguel	2.87	3.10	2.95
Gatun	3.24	3.01	3.19
Colon	2.74	5.97	4.40
Total (average)	2.44	4.44	3.13

TABLE XVI.—NUMBER OF DAYS HOSPITAL TREATMENT FURNISHED VARIOUS CLASSES OF PATIENTS.

Class.	American.	Foreign.	Black.	Total.
Ancon Hospital:				
Panama Canal employees	10,686	3,911	55,629	70,226
Army and Navy patients	14,239	.....	.....	14,239
Panama Government pay patients	.....	36	58	94
Other pay patients	20,195	17,606	23,038	60,839
Charity patients	3,764	1,072	5,606	10,442
Total	48,884	22,625	84,331	155,840
Corozal Hospital (insane):				
Panama Canal employees	181	412	6,940	7,533
Army and Navy patients	893	.....	.....	893
Panama Government pay patients	1,098	22,166	68,686	91,950
Other pay patients	683	1,273	5,835	7,791
Charity patients	142	3,081	20,097	23,320
Total	2,997	26,932	101,558	131,487
Corozal farm (injured employees):				
Panama Canal employees	.....	1,781	10,561	12,342
Chronic ward:				
Charity patients	.....	169	9,457	9,626
Colon Hospital:				
Panama Canal employees	1,575	361	4,079	6,015
Army and Navy patients	679	.....	.....	679
Panama Government pay patients	5	52	295	352
Other pay patients	3,221	1,936	4,055	9,212
Charity patients	559	58	444	1,061
Total	6,039	2,407	8,873	17,319
Palo Seco Leper Asylum (lepers):				
Panama Government pay patients	.....	1,465	14,360	15,825
Charity patients	.....	324	11,682	12,006
Total	.....	1,789	26,062	27,851
Grand totals	57,920	55,703	240,822	354,445

TABLE XVII.—WARD LABORATORY REPORTS.

	Ancon Hospital.	Colon Hospital.	Santo Tomas Hospital.
Blood examinations (total number)	5,656	2,124	2,917
Estivoautumnal	368	158	248
Tertian	157	69	83
Mixed, tertian, and estivoautumnal	17	9	.....
Quartian	10	2	4
Crescents	9	.....	.....
Spirillum of relapsing fever	7	6	1
White blood counts	2,842	560	145
Red blood counts	242	50	69
Differential counts	716	261	136
Hemoglobin estimations	3,804	381	794
Stool examinations (total number):	6,822	1,855	6,493
Ameba coli	47	5	12
Entameba histolytica	20	10	77
Uncinaria ova	705	105	2,096
Ascaris ova	376	62	895
Tricocephalus dispar	476	61	1,102
Bilharzia ova	7	.....	.....
Tinea saginata	7	3	6
Strongyloides	235	35	578
Trichuris	9	8	192
Ciliated monads	57	15	127
Balantidium coli	12	.....	7
Pus cells	257	92	918
Blood corpuscles	118	32	107
Pus and blood	93	1	119
Pus, blood and mucus	40	13	244
Guaiac test for occult blood	139	37	.....
Clonorchis sinensis	.....	.....	1
Urine examinations (total number)	25,698	5,385	7,646
Acetone	382	362	21
Diacetic acid	48	.....	4
Albumin	5,550	1,963	1,660
Sugar	2,328	83	55
Bile	457	10	17
Guaiac test for occult blood	42	22	6
Indican	415	.....	804
Sediment	8,674	404	.....
Epithelial cells	7,600	635	462
Cylindroids	260	.....	240
Hyaline casts	2,624	317	1,051
Granular casts	1,838	278	927
Pus casts	840	206	57
Pus cells	8,006	1,927	1,807
Red blood corpuscles	1,250	468	151
Pus and blood	1,366	12	349
Gonococci	104	3	2
Tubercle bacilli	1	31	.....
Hemin crystals	14	.....	3
Functional kidney tests	51	1	1
Sputum (total examinations)	3,988	1,458	1,312
Tubercle bacilli	340	87	243
Pneumococci	5	9	2
Spinal fluid	405	11	97
Smears of sediment	87	1	72
Pneumococcus	3	.....	8
Meningococcus	1	.....	2
Streptococcus	8	.....	.....
Straphylococcus	1	.....	3
Other organisms	11	1	2
Cell count	351	3	28
Ross Jones test	21	.....	.....

TABLE XVII.—WARD LABORATORY REPORTS.—Continued.

	Ancon Hospital.	Colon Hospital.	Santo Tomas Hospital.
Smear examinations (total number)	1,101	145	6,455
Urethral	850	98	251
Vaginal	195	12	5,579
Eyes	34	3	18
Nasal	23	4	34
Throat	15	12	946
Others	56	2	34
Pleural fluid	.....	.....	5
Flood (for malaria)	4	.....	.....
Widal reactions	.....	.....	40
Urobilin	12	.....	.....

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.	
	Number.	Died.	Number.	Died.	Number.	Died.
Amputations:						
Arm			1		1	
Forearm			1	1		
Hand	1					
Hip joint					2	
Thigh			2	2		
Leg	4	1	2		6	
Foot					2	
Digits, multiple	20		7		15	
Arm, double					1	
Operations on bones:						
Craniectomy decompressive	3		8	2	1	
Craniectomy, exploratory			2	2		
Bone transplantation, simple	4					
Laminectomy	2				1	
Ostiectomy	4				2	
Excision of maxila	1					
Resection of elbow					1	
Wiring of fractures, simple	13		1		3	
Wiring of fractures, compound	2		1		5	
Plating of fractures, simple	4					
Teeth extractions	11					
Adenectomy:						
Cervical	16				18	
Axillary	5				6	
Inguinal, single	254		5		158	
Inguinal, double	52		1		65	
Femoral	20				1	
Vaginal					1	
Herniotomy:						
Inguinal, single	128		16		104	
Inguinal, double	37		5		13	
Femoral	4		1		3	
Ventral	23				19	
Combined (any two of above)					3	
Strangulated	4	1	4	2	1	
Genito-urinary tract:						
Nephropexy	4					
Cystotomy	3				7	
Prostatectomy	2	1				
Urethrotomy, internal	15				50	
Urethrotomy, external	13		2		20	
Varicocele, radical cure	23				15	
Hydrocele, single, radical cure	38		4		22	
Hydrocele, double, radical cure	5				13	
Orchidectomy	5				8	
Epididymotomy	73		3		19	
Vasectomy	9					
Amputation of scrotum	2				2	
Amputation of penis	1				1	
Amputation of penis and scrotum					20	
Curettage uteri	205		4		117	
Perinepoplasty	17		1		43	
Nephrectomy	10					
Nephrotomy	2					
Trachelorrhaphy	4		1		2	
Vaginal punctures	4		1			
Vaginal section					1	
Vaginal hysterectomy					23	

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.—Continued.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.	
	Number.	Died.	Number.	Died.	Number.	Died.
Genito-urinary tract—Continued:						
Circumcision	291		1			
Ureterotomy	1					
Obstetrical:						
Cæsarian section, abdominal	4	1	2			
High forceps	1					
Low forceps	7		6	1		
Accouchement forceps	3		3	1		
Version	1		6	1		
Perineorrhaphy	27				1	
Thorax:						
Excision of breast	2		1		2	
Thoractomy	8		3			
Thoracoplasty	1					
Rectum:						
Hemorrhoids, radical cure	98		5		34	
Fistula in ano, excision of			2		13	
Abscess, Ischio-rectae			1			
Resection of	1					
General:						
Thyroidectomy	8	1	1		3	
Varicose veins, excision of	8				4	
Tenorrhaphy			1		2	
Excision of surface neoplasms	4					
Stab wounds of soft parts, operation for	1	1	1			
Extensive injuries soft parts, operation for	1		1			
Gun shot wounds of soft parts, operation for					3	
Plastic operations for severe injuries	1	1	9	1	4	
Plastic operations for chronic peritonitis	1		1			
Plastic operations for congenital defects	3				1	
Plastic operations for effects of disease	7		1		4	
Skin graft	2		2		16	
Aneurismorrhaphy	1					
Enterorrhaphy			1			
Laparotomy:						
For general peritonitis	1		5	2	1	
For tubercular peritonitis	3					
For intestinal obstruction	1		2		6	1
Exploratory	26		1 4	1	17	
Gastro-enterostomy	4				4	
Entero-enterostomy	2	1				
Enterectomy			2			
Appendectomy	167		24	1	188	
Appendectomy with local peritonitis	9		24	3	2	
Appendectomy with general perionitis	10	3	6		5	
Colostomy	1				7	
Cholecystotomy	3		2		4	
Cholecystostomy	6		1		6	
Cholecystectomy	4				8	
Abscess of liver, laparo-hepatotomy	1				2	
Abscess of liver, thoraco-hepatotomy	1		1			
Splenectomy					1	
Pan-hysterectomy	1		1		46	
Supravaginal hysterectomy	36		5	1	86	
Hysteromyomectomy	16		1		16	
Myomectomy	3		1		1	

TABLE XVIII.—SURGICAL OPERATIONS PERFORMED.—Continued.

	Ancon Hospital.		Colon Hospital.		Santo Tomas Hospital.	
	Number.	Died.	Number.	Died.	Number.	Died.
Laparotomy—Continued:						
Salpingectomy, double	2		5	3		
Salpingectomy	7		4			
Salpingostomy, single	3		1	1	30	
Salpingostomy, double	4				129	
Salpingo-oophorectomy	18		16		164	
Ovarian cystectomy	10		2		17	
Oophorectomy	7		4		67	
Suspensio-uteri	71		13		88	
Ectopic gestation	6	1	2		2	
General peritonitis	2				1	
Rupture of liver	1					
Rupture of spleen					1	
Gunshot wound of abdomen					1	
Hematoperitoneum	1					
Mayo bunion operation	1					
Arsphenamine, intravenous	3,619					
Cauterization	228					
Minor operations, various other	1,579	1	168	1	806	
Major operations, various other	32		21	1	179	
Total	7,415	14	437	27	2,767	1

TABLE XIX.—REPORT SHOWING NUMBER OF OPERATIONS IN THE EYE, EAR, NOSE AND THROAT CLINIC.

ANCON HOSPITAL.

Eye:	
Cataract extraction:	
Combined	7
Linear	2
Chalasion, removal	46
Conjunctival flap	1
Enucleation	9
Evisceration	1
Foreign body, removal	16
Hordeolum, incision	7
Iridectomy	5
Lachrymal operations:	
Dilation of ducts	7
Lid operations:	
Expression of lids	2
Plastic	1
Needling	8
Paracentesis	4
Pterygium	66
Refractions	1,662
Sclerotomy	1
Cautery of cornea	2
Ear:	
Furuncle, incision	8
Foreign boy, removal	3
Mastoid operation:	
Simple	17
Radical	1
Paracentesis	66
Plastic	2
Polypi, removal	5
Nose:	
Cauterisation	4
Plastic	1
Polypi, removal	12
Rhinoplasty	6
Sinuses:	
Ethmoid, simple	10
Ethmoid, radical	1
Frontal, simple	12
Frontal, radical	2
Maxillary, puncture and irrigation	26
Sphenoid, simple	1
Spur, removal	1
Submucous resection	64
Tuberinectomy	45
Maxillary sinus, radical	1
Pharynx:	
Adenoidectomy	253
Cleft palate	1
Peritonsillar abscess	22
Tonsillectomy	431
Uvulectomy	5
Plastic throat	1
Trachea:	
Tracheotomy	1

SANTO TOMAS HOSPITAL.

Eye:	
Cataract extraction:—	
Simple	71
Combined	6
Chalasion, removal	7
Enucleation	6

SANTO TOMAS HOSPITAL—Continued.

Eye—Continued:	
Evisceration	3
Foreign body, removal	28
Hordeolum, incision	9
Iridectomy	14
Paracentesis	2
Pterygium	19
Refractions	11
Ear:	
Furuncle, incision	4
Foreign body, removal	12
Mastoid operation:	
Simple	6
Radical	1
Polypi, removal	3
Nose:	
Cauterization	9
Foreign body, removal	10
Plastic	2
Polypi, removal	9
Submucous resection	3
Tubinectomy	33
Pharynx:	
Adenoidectomy	17
Cleft palate	2
Peritonsillar abscess	23
Tonsillectomy	129
Larynx:	
Foreign body, removal	6
Trachea:	
Tracheotomy	7

TABLE XX.—REPORT OF X-RAY DEPARTMENT, ANCON HOSPITAL.

Nature of examinations:	
Abdomen	3
Arm	139
Chest	278
Colon	4
Dental	417
Elbow	79
Finger	2
Foot and ankle	319
Foreign body	18
Gall bladder	70
Hand	221
Head	44
Heart	1
Hip	66
Jaw	67
Kidney	136
Knee	90
Leg	93
Liver	7
Pelvis	20
Ribs	43
Shoulder	166
Sinuses	705
Spine	84
Spleen	1
Stomach	177
Thigh	46
Toe	1
Treatment	52
Wrist	129

CLASSIFICATION OF X-RAY PLATES USED.

5 x 7	6
6½ x 8½	1,225
8 x 10	1,616
10 x 12	2,283
14 x 17	1,005
Dental films	1,533
X-ray films	364
Total	8,032

TABLE XXI.—SANTO TOMAS HOSPITAL.

PATIENTS TREATED.

Class.	Remaining Dec. 31, 1919.	Admitted.	Died.	Discharged.	Remaining Dec. 31, 1920.
Pay cases	15	980	36	931	28
Charity cases	397	8,472	778	7,748	343
Total	412	9,452	814	8,679	371

Class.	Number treated.	American.		Other nations.	
		White.	Black.	White.	Black.
Pay cases	1,307	27	.....	526	754
Charity cases	13,277	28	.....	1,530	11,779
Total	14,584	55	.....	2,056	12,533

Number of days relief furnished patients	155,593
Average number of patients constantly sick	422
Average number of days treatment for each patient admitted	10
Cost of subsistence per patient per day	$0.371
Cost of hospitalization per patient per day	$1.515

DISPENSARY REPORT.

Class.	White.	Black.	Total.
Natives treated	16	6,060	6,076
Foreigners treated	149	2,605	2,764
Total	165	8,665	8,840

TABLE SHOWING NUMBER OF DISCHARGES AND DEATHS.

	Discharged.	Died.
Typhoid fever	2	1
Malaria	201	3
Malarial fever, estivoautumnal	146	5
Malarial fever, tertian	5	
Smallpox	5	
Measles	119	
Scarlet fever	1	
Whooping cough	4	
Diphtheria and croup	79	4
Influenza	367	17
Dysentery	56	2
Dysentery, entamebic	2	1
Leprosy	4	
Erysipelas	11	
Dengue	3	
Chicken pox	72	
Mumps	1	
Purulent infection and septicemia	35	11
Anthrax	3	1
Tetanus	2	2
Pellagra	3	3
Beriberi	2	
Tuberculosis of the lungs	80	170
Acute miliary tuberculosis	2	1
Abdominal tuberculosis	2	
Pott's disease	2	1
Tuberculosis of bones and joints	1	
Tuberculosis of other organs	16	5
Tuberculosis of the lymph glands	2	
Disseminated tuberculosis	2	3
Rickets	1	
Syphilis, primary	370	21
Syphilis, tertiary	74	12
Gonococcus infection	604	3
Gonorrhea	120	1
Gonorrheal arthritis	108	
Gonorrheal bubo	20	
Soft chancre	121	1
Adenitis chancroidal	32	
Cancer and other malignant tumors of the buccal cavity	8	3
Cancer and other malignant tumors of the stomach, liver, esophagus, and pharynx	4	2
Cancer and other malignant tumors of the peritoneum, intestines, rectum	5	2
Cancer and other malignant tumors of the female genital organs	7	4
Cancer and other malignant tumors of the breast	6	
Cancer and other malignant tumors of the skin	2	
Cancer and other malignant tumors of other organs and of organs not specified	8	4
Other tumors	14	4
Acute articular rheumatism	12	
Chronic rheumatism and gout	14	
Gout	2	
Diabetes	2	1
Addison's disease	1	
Leukemia	1	
Anemia, chlorosis	5	1
Other general diseases	24	1
Alcoholism	54	1
Drug habit	2	
Encephalitis	1	
Simple meningitis	3	11
Locomotor ataxia	1	1
Other diseases of the spinal cord	1	
Acute anterior poliomyelitis		7
Cerebral hemorrhage, apoplexy	5	5

TABLE SHOWING NUMBER OF DISCHARGES AND DEATHS.

	Discharged.	Died.
Softening of the brain	.....	1
Paralysis without specified cause	17	4
Other forms of mental alienation	18	1
Epilepsy	33	.....
Convulsions of infants	.....	1
Hysteria	4	.....
Neuritis	8	1
Other diseases of the nervous system	14	2
Neurasthenia	1	.....
Diseases of the eyes and their annexa	111	1
Cornea	10	.....
Diseases of the ears	15	2
Otitis media	4	.....
Pericarditis	3	3
Acute endocarditis	3	4
Organic diseases of the heart	33	24
Angina pectoris	1	.....
Diseases of the arteries, atheroma, etc	30	12
Arteriosclerosis	6	.....
Embolism and thrombosis	.....	1
Diseases of the veins	34	.....
Hemorrhoids	21	1
Diseases of the lymphatic system	87	1
Lymphadenitis	1	.....
Hemorrhage	2	4
Diseases of the nasal fossæ	32	.....
Diseases of the larynx	3	.....
Laryngitis	3	.....
Diseases of the thyroid body	1	.....
Acute bronchitis	118	4
Chronic bronchitis	33	6
Broncho-pneumonia	46	25
Pneumonia, unqualified	20	20
Lobar pneumonia	40	26
Pleurisy	24	2
Empyema	2	.....
Gangrene of the lungs	2	.....
Asthma	16	.....
Other diseases of the respiratory system	1	5
Hay fever	2	1
Diseases of the mouth and annexa	2	1
Diseases of the teeth and gums	21	2
Diseases of the pharynx	115	.....
Follicular tonsillitis	36	.....
Ulcer of the stomach	5	1
Other diseases of the stomach	47	9
Gastrectasis	3	.....
Acute gastritis	4	.....
Diarrhea and enteritis (under 2 years)	29	24
Colitis (under 2 years)	21	6
Diarrhea and enteritis (2 years and over)	28	13
Colitis (2 years and over)	4	1
Ankylostomiasis	135	2
Intestinal parasites	254	3
Strongyloidosis	2	.....
Appendicitis and typhlitis	108	3
Acute appendicitis	11	.....
Chronic appendicitis	5	.....
Hernia, intestinal obstructions	144	8
Constipation	59	1
Duodenal ulcer	14	.....
Cirrhosis of the liver	10	4
Biliary calculi	5	.....
Other diseases of the liver	16	6
Abscess of liver (unqualified)	2	1

TABLE SHOWING NUMBER OF DISCHARGES AND DEATHS.

	Discharged.	Died.
Abscess of the liver, entamebic	.....	2
Cholecystitis	5	.....
Diseases of the spleen	13	1
Simple peritonitis, nonpuerperal	4	6
Other diseases of the digestive system	6	.....
Acute nephritis	3	7
Bright's disease	157	77
Other diseases of the kidney and annexa	6	3
Pyelo-nephrosis	1	1
Calculi of the urinary passages	3	.....
Diseases of the bladder	32	4
Cystitis	4	1
Diseases of the urethra, urinary abscess, etc	52	.....
Stricture of the urethra, nonvenereal	44	.....
Vesico-vaginal fistula	1	.....
Diseases of the prostate	3	.....
Nonvenereal diseases of the male genital organs	46	1
Hydrocele	12	1
Uterine hemorrhage, nonpuerperal	3	.....
Uterine tumor, noncancerous	42	2
Other diseases of the uterus	23	1
Metritis	137	1
Cysts and other tumors of the ovary	20	1
Salpingitis and other diseases of the female genital organs	203	3
Nonpuerperal diseases of the breast, cancer excepted	4	.....
Normal labor	840	.....
Accidents to pregnancy	157	3
Puerperal hemorrhage	1	3
Other accidents of labor	8	1
Puerperal septicemia	.....	1
Puerperal albuminuria and convulsions	3	.....
Eclampsia	1	.....
Following childbirth, not otherwise defined	4	.....
Puerperal diseases of the breast	1	.....
Gangrene	1	1
Furuncle	14	1
Acute abscess	101	1
Phlegmon and cellulitis	5	.....
Scabies	30	.....
Elephantiasis	2	.....
Ulcer of the skin	175	1
Other diseases of the skin and annexa	58	.....
Diseases of the bones, tuberculosis excepted	56	.....
Periostitis	1	.....
Diseases of the joints, tuberculosis and rheumatism excepted	19	.....
Arthritis	1	.....
Amputations	2	.....
Other diseases of the organs of locomotion	11	1
Congenital malformations	49	.....
Newborn child	705	.....
Icterus and sclerema	87	109
Other causes peculiar to early infancy, including various consequences of labor	.....	1
Senility	29	.....
Suicides	.....	1
Poisoning by food	2	1
Other acute poisonings	5	1
Burns, conflagration excepted	33	3
Traumatism by firearms	22	2
Traumatism by cutting or piercing instruments	86	2
Traumatism by fall	61	3
Traumatism by machines	10	.....
Traumatism by other crushings	41	2
Traumatism by landslides	1	.....
Injuries by animals	10	.....

TABLE SHOWING NUMBER OF DISCHARGES AND DEATHS.

	Discharged.	Died.
Lightning	1	
Electricity, lightning excepted	1	2
Homicide by firearms		2
Fractures, cause not specified	34	3
Sprains	22	1
Other external violence	78	
Cause of death not specified or ill-defined	2	1
Infections of undetermined origin	5	
No disease	36	
Feigned disease	138	

TABLE XXII.—COROZAL HOSPITAL—STATEMENT OF COMMITMENTS AND DISCHARGES.

COMMITMENTS.

	Male.	Female.
From Canal Zone:		
First admission	62	19
Second admission	1	2
From Panama Government:		
First admission	46	31
Second admission	7	2
Totals	116	54

DISCHARGES.

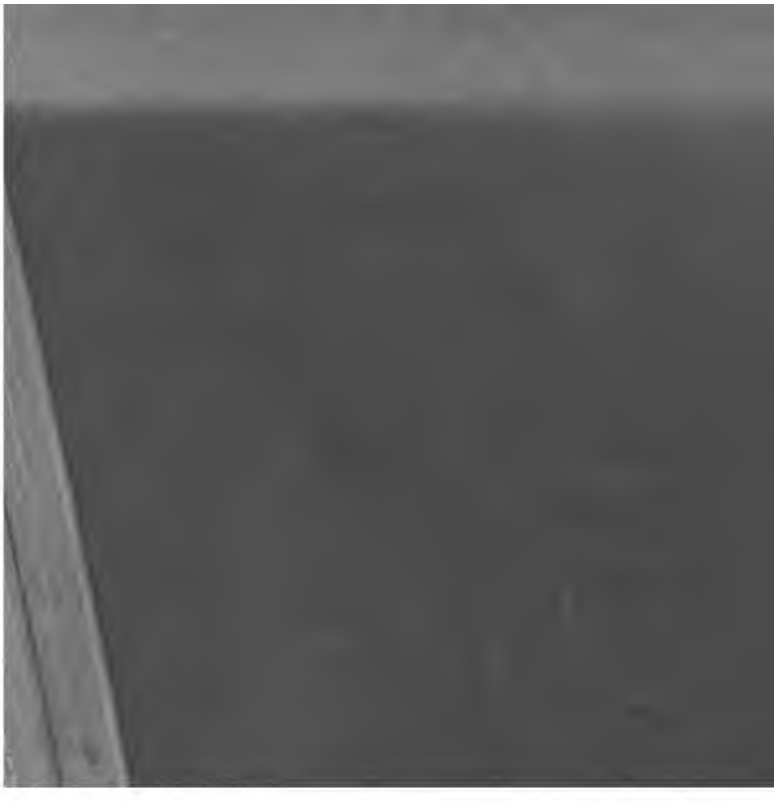
	Well.		Improved.		Unimproved.	
	Male.	Female.	Male.	Female.	Male.	Female.
Antigua	1		1			
Barbados	3	6	7	6	1	3
Bolivia						1
Chile	1					
Colombia	1		2			1
England					1	
France			1			
Granada			2			
Jamaica	3	3	6	8	2	2
Martinique		1		2	1	
Nicaragua					1	
Porto Rico	1					
Panama	12	4	6	5	4	2
Peru			1			
Spain	1					1
St. Lucia			1	1		
United States	8		12		11	
Venesuela	1					
Trinidad	2		1			
Turk's Island			1			
Sweden	1					
Russia					1	
Totals	35	15	41	22	22	10

TABLE XXIII.—CONTAGIOUS AND INFECTIOUS DISEASES.

Reported during the year 1920.

	Panama.	Colon.	Canal Zone.	Non-resident.	Total.
Acute contagious conjunctivitis (pink eye)	.....	4	.....	.....	4
Chicken pox	79	24	105	9	217
Diphtheria	95	37	37	3	172
Dysentery	41	16	11	36	104
German measles	.....	1	.....	.....	1
Erysipelas	9	3	1	6	19
Favus	1	.....	.....	.....	1
Hookworm	.....	2	1	.....	3
Influenza	313	482	473	46	1,314
Relapsing fever	1	.....	3	5	9
Leprosy	4	.....	3	2	9
Malaria	100	41	[1] 728	352	1,221
Measles	154	89	103	8	354
Meningitis, tuberculous	3	1	3	2	9
Mumps	21	15	73	3	112
Ophthalmia neonatorum	1	3	.....	.....	4
Para-typhoid	1	.....	.....	1	2
Pellagra	5	3	1	2	11
Pneumonia	175	56	34	40	305
Acute anterior poliomyelitis	6	.....	1	2	9
Scarlet fever	4	5	3	1	13
Septic sore throat	.....	.....	1	.....	1
Smallpox	14	.....	.....	11	25
Tetanus	5	1	.....	1	7
Tuberculosis	311	121	70	105	607
Typhoid fever	8	9	2	17	36
Whooping cough	4	69	70	.....	143

[1] 576 cases sanitated area, 117 cases cattle camps and plantations, 35 miscellaneous unsanitated areas.

TABLE XXIV.—FORCE REPORT.

	December 31, 1920.			1919.	1918.
	Gold.	Silver.	Total.		
Chief health office	3	.....	3	3	4
Medical storehouse	4	4	8	8	9
Quarantine service	11	33	44	47	48
Health office, Panama	12	109	121	164	158
Health office, Colon	14	145	159	173	155
Ancon Hospital	134	226	360	368	338
Colon Hospital	25	35	60	55	50
Santo Tomas Hospital	7	.....	7	6	6
Palo Seco Leper Asylum	2	48	50	40	34
Zone sanitation	5	138	143	223	168
Corozal Hospital and farm	16	82	98	113	114
Dispensaries	11	8	19	16	25
Total	244	828	1,072	1,216	1,109